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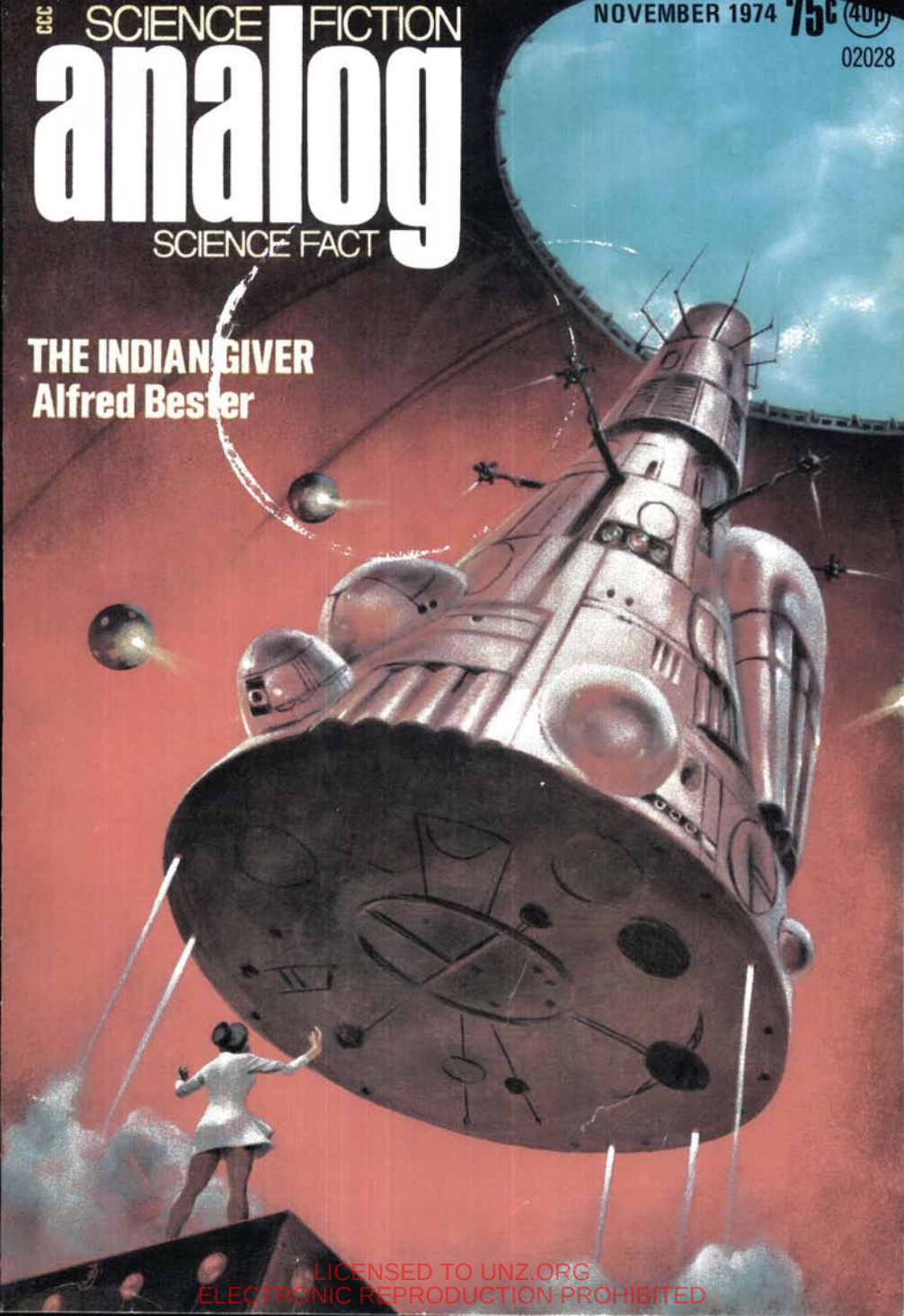

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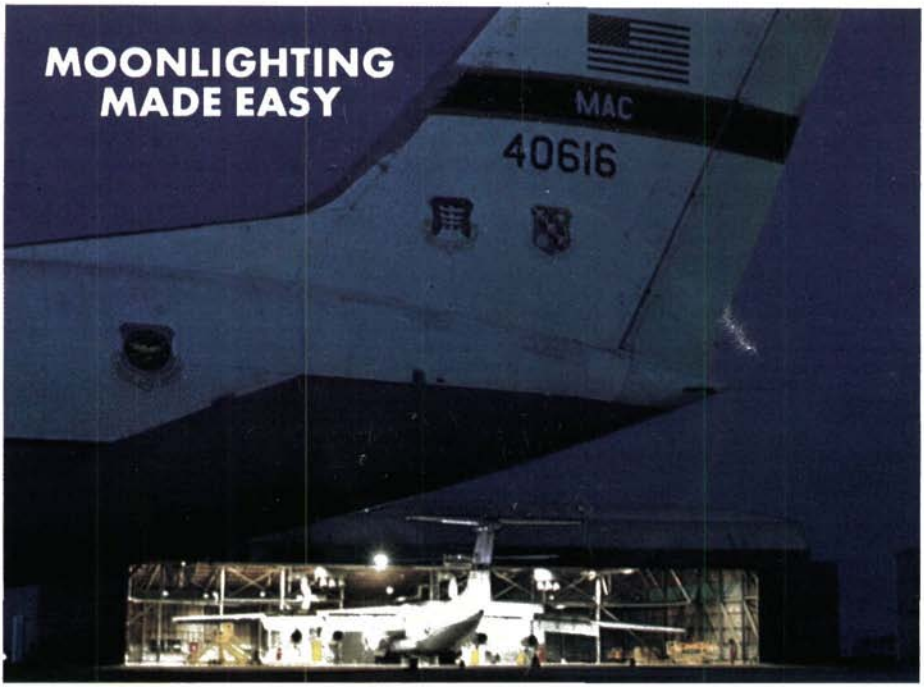

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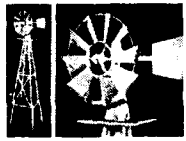

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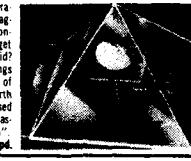

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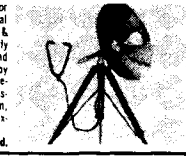

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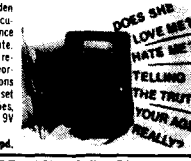

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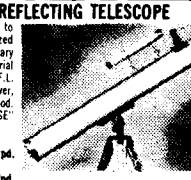

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Next Issue on Sale November 7, 1974
$7.50 per year in the U.S.A.
75 cents per copy
Cover by Jack Gaughan

Vol. XCIV, No. 3 / NOVEMBER 1974

SERIAL

THE INDIAN GIVER, Alfred Bester 12
(Part One of Three Parts)

NOVELETTE

WHEN NO MAN PURSUETH, Spider Robinson..... 110

SHORT STORIES

A HOUSE BY ANY OTHER NAME, L.E. Modesitt, Jr. . 77
THIS BEST OF ALL POSSIBLE WORLDS,
Joe Haldeman 137
UNLIMITED WARFARE, Hayford Peirce 150

SCIENCE FACT

LIFE IS IN THE STARS, Thomas A. Easton 95

READER'S DEPARTMENTS

GUEST EDITORIAL, James Gunn 5
THE ANALYTICAL LABORATORY 109
THE REFERENCE LIBRARY, P. Schuyler Miller 160
AnaLOG, A Calendar of Upcoming Events 165
BRASS TACKS 166
IN TIMES TO COME 177

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Editorial and Advertising offices: Condé Nast Building, 350 Madison Avenue, New York, New York 10017
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Guest Editorial by James Gunn

TEACHING SCIENCE FICTION REVISITED

The science fiction ghetto may be breaking up, but signs of the ghetto mentality still lurk among us: those who have possessed science fiction for so long that they consider her their own look upon any glance at a larger audience as proof of infidelity. A basic distrust of strangers, particularly those who use a different language, and a possessiveness about ghetto culture breed fear of those who would integrate ghetto dwellers and their arts into the general culture, and nourish an inner conviction that separatism might be best after all.

Our insecurity, our feelings of inferiority, make us suspicious of overtures from outside. Our history and our natures render us incapable of enjoying booms without dreading busts. We are, let us face it, a bit paranoid.

Professor Philip Klass (who teaches science fiction at Pennsylvania State University and writes it—alas, too infrequently these days—under the name of William Tenn) has compared science fiction with jazz, and I have a vision of science fiction as a prescient jazz musician playing piano in a turn-of-the-century New Orleans cat house. As his fingers rock over the keys, he is saying to himself: "Look at that s.o.b. sitting over there in the corner taking notes. Pretty soon he's gonna start a band in Kansas City or Chicago and make real money while I'm still sitting here collecting nickels and dimes, and then some dudes what never saw New Orleans are gonna make fortunes writing this stuff—writing! you don't write jazz, you just play it—and guys in white shirts and black ties are gonna perform it in those big, fancy New York halls, and kids are gonna study it in schools—and hell! that ain't gonna be jazz!"

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Maybe not, and maybe it ain't gonna be science fiction, but events march on as surely as the tides roll in, and nothing we do is going to change that fact. We might, of course, be able to control the nature of those events or the path of the tides.

The ghetto "us-against-them" attitude, which gave science fiction fandom its strength and science fiction writers their feelings of brotherhood, erupts today in concern about the teaching of science fiction, such as the Editorial in the June 1974 issue of Analog.

First let me throw away the first half of the Editorial. I don't wish to defend science fiction in movies or on television, which I have personal reasons to think is terrible. One may count on the fingers of three hands the movies which are both good movies and good science fiction. Motion pictures and television are committee efforts controlled by money, which is always conservative, and by people who know nothing about science fiction and care less. The wonder is not that there is not more art in the visual media but that there is any at all.

At the same time we should admit that science fiction publishers have been almost as guilty. The movies and television have turned off potential readers of SF—but so has SF. The monster movies of the Fifties turned people away saying, "If that is SF I don't want any more," but so did the BEM covers of the Thirties, Forties, and Fifties. The only meaningful part of science fiction is the story and if the reader can fight his way through all the obstacles to reach it, he either will like it or he won't.

Second, I don't want to defend science fiction teaching, since no one has sufficient information about it to either praise or condemn. Nor is this a defense of academic criticism, to which Sturgeon's Law applies fully as much as to science fiction. What I hope to do is bring a little perspective to the discussion of science fiction teaching, and what I wish to discuss are two issues raised by the June Editorial: the qualifications of science fiction teachers and the effect of the teaching of science fiction upon potential new readers.

I'll grant immediately the Editorial's assumption that most science fiction teachers do not know enough about science fiction—not as much, certainly, as you and I, nor perhaps as much as your average reader. Let me grant also that they are not going to teach their science fiction courses the way we would teach them; probably we will not agree with their approaches, their tastes, their conclusions, and their results. But this would be true of any courses that you and I might teach. I know that Harlan Ellison, who is a vocal critic of science fiction teaching, would not like my historical approach to the field, and

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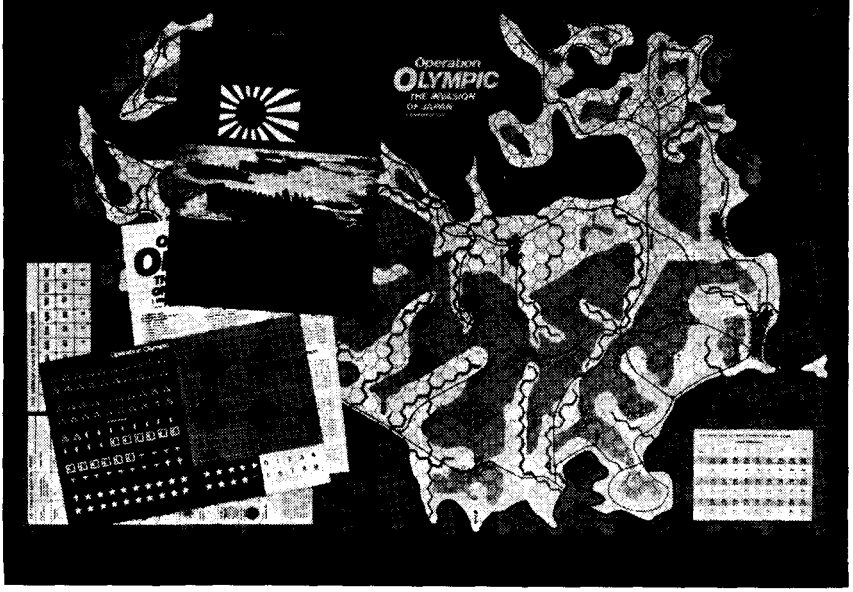
Strategy & Tactics



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I suspect that I would not approve of all his judgments about what is important.

Joanna Russ, Phil Klass, Jack Williamson, and I—science fiction writers and English teachers all—have different ideas about what a course in science fiction ought to be. Who is right, and who is to say which of us is right, or if any of us are right, or if we are not all right?

Every new discipline goes through a period of experimentation and discovery. Every new discipline begins with no qualified teachers. African Studies was a product of the Sixties: no qualified teachers. Popular culture courses are no older than ten or fifteen years, and American Studies is not much older. Anthropology split away from sociology after World War Two in many universities, and departments of journalism, which originated in the early part of this century, became schools about the same time.

Schools of Business date back to the Twenties, most of them, and began with no qualified teachers. Schools of Education came about the turn of the century . . . We can simplify the whole historical discussion by pointing out that departments originated when Eliot (of the famous five-foot shelf) introduced the elective system into Harvard when he became president in 1869. At that time, incidentally, the high school was virtually nonexistent (500) and compulsory primary education was just beginning to gain momentum across the nation.

And there were no qualified teachers.

So—science fiction teaching is going to go through the same process of accumulating experience and exchanging ideas and improving itself, and will never reach a stage where either the qualifications of the teachers or their agreement about subject matter will equal those in the sciences. The humanities have no objective measurements, no duplicatable experiments; they aim at increasing sensitivity, improving the ability to read with understanding, and providing the breadth and depth of intellectual experience which will encourage the making of wise choices.

They don't always succeed.

In the humanities, each teacher chooses his own texts and his own approach to the subject; each does what he can, in the best way he can. Professional organizations do not exist to determine qualifications—such determinations are made at the college or departmental level by the teacher's peers and sometimes his students—but to provide means of communicating among teachers and scholars in the field. In the early stages of the development of a discipline, professional organizations collect and observe and provide a central point for people to gather and discuss what they are doing, much as Mil-

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ford in the Fifties and SFWA in the Sixties did for science fiction writers.

Moreover, teachers of science fiction are not just in English but in history, sociology, engineering, political science, anthropology, religion, philosophy, chemistry, physics, and many more disciplines, no doubt.

Science fiction teaching will develop its own criteria, its own canon, its own tools, and we can agree on this—it behooves those of us who have vested interests in its welfare to contribute our ideas and see that they are heard. Many of us, therefore, are active in the Science Fiction Research Association, attend scholarly meetings, lecture there and at other colleges, prepare histories and texts, write articles, and provide other materials useful in teaching, such as the lecture films about science fiction, featuring science fiction writers and editors, that we have been producing at the University of Kansas.

Many experienced writers and editors in the field have been supplying teaching materials and guidance. Robert Silverberg's "Mirror of Infinity," with critical essays by science fiction writers, has sold well, as has Harry Harrison's "The Light Fantastic" and his high school anthology (with Carol Pugner) "A Science Fiction Reader." Jack Williamson has written his study of the early work of H.G. Wells, Brian Aldiss, his "Billion Year Spree," Donald Wollheim, his "The Universe Makers." Reginald Bretnor brought together the contributions of fifteen science fiction writers in his "Science Fiction, Today and Tomorrow"; and Frank Herbert has his name on an anthology for the academic market (along with three collaborators), entitled "Tomorrow, and Tomorrow, and Tomorrow . . ." Harlan Ellison has announced that he is collaborating on another science fiction text. My history of science fiction, "Alternate Worlds," will be out in the spring of 1975.

True, other texts unsanctified by the name and ideas of a science fiction writer are proliferating. Many of them do not share our viewpoints—even those we have in common—and some of them clearly are using science fiction for their own ends. But who among us is not?

There is even a "Cliffs Notes" on science fiction, which some automatically would call the ultimate rape of science fiction by the academic world, but, as a matter of fact, the author, an L. David Allen at the University of Nebraska, put together a useful book with some illuminating concepts and some insightful analyses.

Many SF authors and editors have bemoaned the effect of academic criticism on science fiction. The dead hand of academic criticism will kill science fiction just as

continued on page 175

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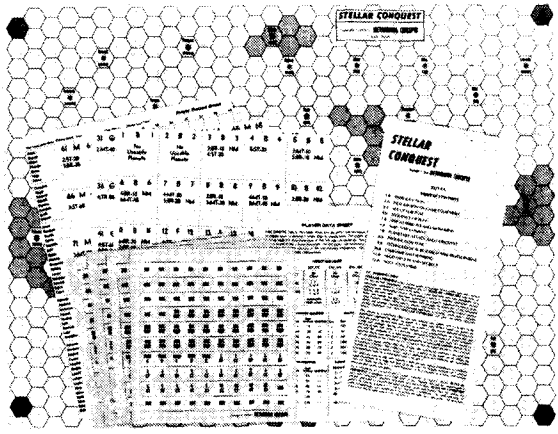

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Part One
of Three Parts

I tore down the Continental Shelf off the Bogue Bank while the Pogo made periscope hops trying to track me. Endless plains of salt flats like the steppes of Central Russia (music by Borodin here); mounds of salts where the new breed of prospector was sieving for rare earths; towers of venomous vapors on the eastern horizon where the pumping stations were sucking up more of the Atlantic and extracting deuterium for energy transfer. Most of the fossil fuels were gone; the sea level had been lowered by two feet; progress.

I was headed for Herb Wells' hideout. He's perfected a technique for reclaiming gold (which nobody wants these plastic days) and is shlepping ingots back into the past with a demented time-dingbat which is why the Group has nicknamed him H. G. Wells. Herb is making gifts of gold to characters like Van Gogh and Mozart, trying to keep them healthy, wealthy and wise so they'll create more goodies for posterity. So far it's never worked. No "Son of Don Giovanni." Not even "The Don Meets Dracula."

Following the Thieves & Vagabonds road signs that Herb puts out for the Group, I went under a mound and tunneled through the salts, absorbing NaCl, $MgCl_2$, $MgSO_4$, calcium, potassium, bromides and probably traces of Herb's gold which he'd grudge me. I came out at the bunker hatch. Locked, of course. I hammered on it while the Pogo bounced and thrummed overhead and it was six, two and even they'd get me before Herb heard me, but he heard me.

"*Quien dat? Quien dat?*" he called in Black Spanglish.

"It's Guig," I hollered in XXth Century English. That's the secret cant the Group uses. "I'm in a jam. Let me in."

The hatch swung down and I fell in. "Freeze it, Herb. The fuzz may have spotted me."

He slammed the hatch and froze the grommets. "What the hell have you been up to, Guig?"

"The usual. I killed another guy."

"The fuzz making a fuss about murder? Don't put me on."

"He was the governor of the Corridor."

"Oh. You shouldn't kill the importants, Guig. People don't understand."

"I know, but they're the only candidates worth killing."

"How many failures have you had so far?"

"I've lost count."

"And no success," Herb meditated. "Maybe we ought to sit down and discuss it. The first question should be, is it a problem of perplexity or complexity? I think—"

A pounding made the hatch vibrate.

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"There's goody-two-shoes," I said without joy. "Can you shoot me timesome in your dingbat, Herb?"

"But you always refused to shoot a trip." He gave me a mournful look. "You hurt my feelings."

"I've got to disappear for a few hours. If they don't find me here they won't bother you. I apologize about the dingbat, Herb, but I was always scared of that thing. The whole Group is."

"So am I. Come on."

I followed him into the Chamber of Horrors and sat down in the insane machine which looks like a Praying Mantis. Herb handed me an ingot. "I was just going to give this to Thomas Chatterton. You deliver it for me."

"Chatterton? The kid poet?"

"In the flesh. Committed suicide in 1770, greatly regretted. Arsenic. He was out of bread and out of hope. You're going back to London. He's holed up in an attic in Brook Street. Got it?"

"Neither rain nor snow nor gloom of—"

"I'll put it on a three-hour snatch. That ought to give you enough time. I'll shoot you to a prominent place so you can get your bearings. Don't wander too far or the thing won't be able to grab you."

The pounding got louder and more peevish. Herb did things with calibrations and switches and there was a crackle of french-fried power (which I'll bet he never pays for) and I was sitting in a mud puddle in the rain and a George Washington type on a chestnut horse nearly rode me down and bawled hell out of me for obstructing a public road.

I got up, backed off the road, and someone kicked me in the brain. I jumped and turned around and it was a pop-eyed corpse hanging from a gibbet. Herb had shot me to a prominent place, all right, Tyburn. I hadn't been in London in years (rotten with fall-out residues) and certainly never in 1770, but that gave me my bearings. Tyburn had been turned into Marble Arch. I was on the outskirts of Eighteenth Century London. No Bayswater Road, yet; no Hyde Park; just fields, trees, meadows, and the little Tyburn creek meandering. The city was on my left.

I walked down a path that would someday be Park Lane and turned left into the fringe of houses. They became thick and crowded when I reached a cow pasture that would become Grosvenor Square. A Saturday night market was in progress. Hundreds of barrows and stalls illuminated by flaring torches, grease lamps with flags of flame, humble tallow candles. Roars of hucksters: "Eight a penny! Stunning pears!" "Chestnuts all 'ot! Penny a score!" "Beautiful whelks, penny a lot!" "Fine warnuts, sixteen a penny!" I was hungry but I didn't have any current coin; just three pounds of refined gold.

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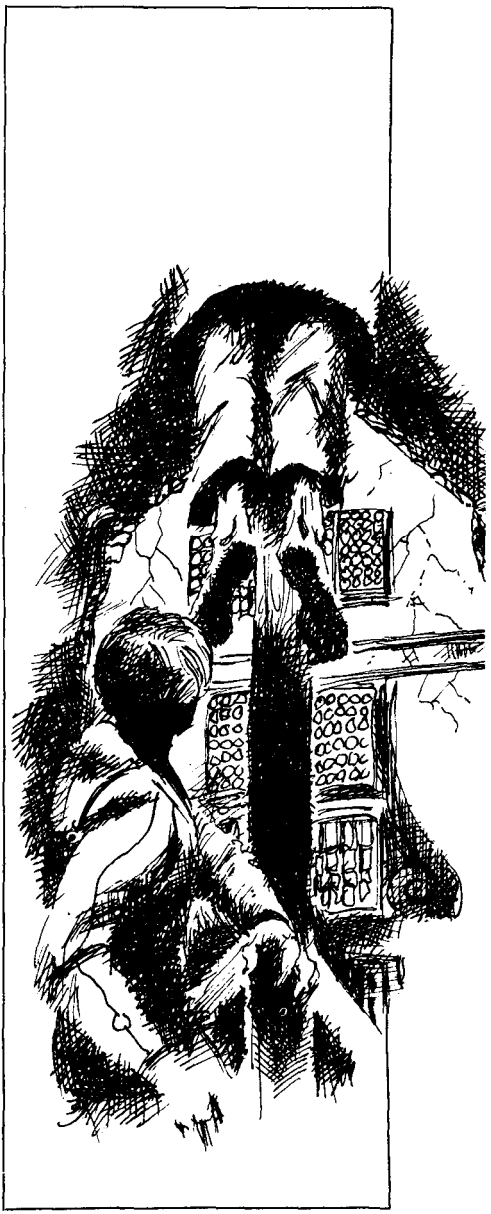
I remembered that Brook Street led off the north side of Grosvenor so I took that route asking for a writer named Chatterton. Nobody ever heard of him until I came across a Flying Stationer hung with broadsheets offering "The Life of the Hangman," "Secret Doings in Soho," "The Treacherous Servant," that sort of thing. He said he knew Chatterton. The kid wrote long-song poems for him at a shilling ea., and he pointed out the house which had no business to be standing.

I ran up the crumbling stairs, convinced I'd fall through at every step, and burst into the attic with a merry, "Gold! Gold! Gold! Bright and yellow, hard and cold!" (Thomas Hood, 1799-1845.) The kid was writhing on a pallet in the last agonies of arsenic poisoning. "Ah-ha!" I thought. "He's dying. He knows he's dead. If I can save him maybe we've got another Moleman for the Group."

I did my best. The first thing to do is make them vomit. I pee'd into a tumbler and forced it down Chatterton's throat. No nausea. Too far gone. I ran down the stairs and banged on a door. It was opened by Betsy Ross's grandmother, complaining. I shoved past her, saw a jug of milk, took it and a clutch of charcoal from the cold fireplace. She had now graduated to screaming. I returned to my house call. Charcoal and milk. Nothing. He was gone, greatly regretted, and



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what the hell was I going to do with 36 oz. (troy) of gold which was dragging the butt pocket of my coveralls?

Well, I had to stall anyway until the Mantis put the snatch on me so I went for a walk in the rain. At Fleet Street I turned off and went into the Cheshire Cheese to see if I could parlay the ingot into a drink and maybe dry off in front of the fire which was eclipsed by a snorting whale and a simpering dogfish. The Grand Cham and Boswell.

"What would you do, sir, if you were locked up in a tower with a newborn babe?" dogfish was asking. The whale heaved and growled but before he could answer that monumental question I was yanked back to the dingbat, dripping all over the circuits to the anguish of Herb.

"OutOutOut!" he hollered. "They've left."

I out.

"Why didn't you give Thos. the gold?"

"Too late, man. He gone when I get."

"Oh drat."

"Try again, a little earlier."

"I can't. The damn thing won't shoot the same decade twice. To tell the truth, Guig, I think it's a lemon."

Maybe that's why his Health, Education and Welfare program never works. I thanked Herb, still using the Group XX English, and returned to Spangland, the Gem of the Ocean. I know all this sounds kind of lunatic but I'm up against a tough proposition keeping these notes. I have to translate from Black Spanglish—*Benny Diaz, gemmum, ah gone esplain any pregunta you ax* which is now the official language of the country, and then go on from there. It runs, Spanglish → XX English → Machine Language. It's one hell of a job, especially when it's compounded by sorting out centuries of memories. So I *ax* you to *dispensar* when I jumble. My damn diary won't. How many times when I compile data for it has the print-out snapped, "090-N. READ." which is machine language for, "I can't understand a goddam thing you're saying."

We all have this trouble. Not remembering—our memories stick like graffiti—but placing events in their proper sequence. I have to compile notes and diaries because I worry about this. I'm the baby of the Group and I'm still trying to train myself to develop an organic filing system. I've often wondered how Sam Pepys manages. He's the Group historian and diarist and he tries to explain his system to me. It's perfectly simple for Sam. Like: $A¼ + (½B)^2$ = The breakfast I ate on September 16, 1936, and good luck to Sam.

I've only been around since Krakatoa blew up in 1883. All the others have been on the scene much longer. Beau Brummel survived the

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Calcutta earthquake of 1737 in which 300,000 were killed. Beau says nobody back then would ever believe the mortality figures, and he's still sore because the Honkies didn't give a damn about how many quote niggers unquote died. I'm with him on that. He—Oh, I'd better *esplain* about our names.

The famous names I mention aren't the realsies. We have to move on and change our names so often—the Shorties begin to wonder about us—that nobody can keep track. So we stay with our nicknames in the Group, and we pinch them from real people. They reflect our crotchets and main interests. I've mentioned H. G. Wells and his time-dingbat. There's Tosca, an actress type; Beau, the epitome of the beautiful people; Sam Pepys, the historian; the Greek Syndicate, our financier; Bathsheba, the *femme fatale; und so weiter.* I'm nicknamed *Grand Guignol,* Guig for short, and I don't like it. I don't think of myself as a Theater of Horrors. I'm sincerely trying to do good, through horror, yes, but it's a small price to pay for what I'm offering. Wouldn't you pay an hour of agony for eternal life?

But about our ages: Oliver Cromwell was buried alive in a mass grave during the Black Death and still doesn't want to talk about it. He says death by suffocation is something to forget forever. Scented Song escaped the sack of Tientsin by the Mongols when they piled 100,000 severed heads into pyramids. Her description makes Dachau sound like a picnic. The Wandering Jew is Christ, of course. You can pick up the clue in Luke 24:3. A writer—D. H. Lawrence, I think—smelled the truth when he met Jacy in 1900 and turned it into a fantastic story about how Jacy might have lived a normal life if he'd only balled a bod. He didn't know Jace. We call Christ *Jacy* because if you use his real name it sounds like you're swearing.

There are many others whom you'll meet later on. The oldest, by far, is Hic-Haec-Hoc. He got that nickname because that's what his grunts sound like; he's never learned to speak any language although he can understand simple signs. We think Hic may be from the late Pleistocene or early Holocene and got his charge in some cataclysm that was dramatic enough to make a Neanderthal aware. Who knows? Maybe he got clobbered by a meteor or trampled by a Hairy Mastodon.

We don't see much of Hic these days; people scare him and he's always pulling back from the edge of civilization. We used to wonder how he was going to adapt to the population explosion but the space explosion solved that. He's probably homesteading in a crater on Mars, Mother of Men; a Moleman can live on anything except nothing. Pepys, who keeps track of all of us, like Celebrity Service, claims

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that Hic was spotted once, mousing around the snows of the Himalayas, and he swears that Hic started the legend of the Abominable Snowman.

I use the word *charge* advisedly when I try to explain our immortality. They call it "nerve-firing" nowadays. As near as I've researched it, we all underwent identical traumas which destroyed or discharged the lethal accretions that are the crux of old age and death. If your cells accumulate lethal accretions you're not forever for this world, and all creatures have been endowed with this metabolic suicide. Maybe that's nature's way of wiping the slate clean and trying again. I'm intensely anthropomorphic and I can see nature getting disgusted and closing the show on the road.

But our Group has proven that death doesn't have to be inevitable. Of course, we did it the hard way. Each of us knew we were going to die and received a psychogalvanic shock that wiped out our lethal cell products and turned us into Molecular Men; Molemen for short. I'll explain that later. It's a sort of updating of Cuvier's "Catastrophism" theory of evolution. In case you've forgotten, he argued that periodic catastrophes destroyed all life and God started it all over again on a higher level. He was wrong about the God bit, of course, but catastrophes do alter creatures.

photos by: Bill Westfall

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As described in each case (with the exception of Hic-Haec-Hoc who can't describe anything) the circumstances were almost identical. We were trapped in some natural or man-made catastrophe that gave us no chance of survival; we were aware of it; a psychogalvanic charge ripped through us as we toppled into extinction; then some miracle aborted the death and so here the Group is forever. The odds against this sort of freak are fantastic, but the Greek Syndicate says that even the longest odds are bound to come in sooner or later. The Greek ought to know. He's been a professional gambler ever since Aristotle kicked him out of the Peripatetic School in Athens.

Jacy often describes the wild surprise of death that shocked through him on the cross when he finally realized that he was not going to be rescued by the US Marines. He wonders why the same thing didn't happen to the two thieves who were busted along with him on Golgotha. I keep telling him, "Because they weren't epileptics, Jacy," and he keeps answering, "Oh hush. You're obsessed with that epileptic delusion, Guig. I wish you'd take a lifetime off and learn to respect the mysteries of God."

He may be right. I *am* obsessed with the belief that our Group is epileptic-prone and that there's an historic linkage between epilepsy and the unique. I suffer from it myself, and when that aura hits me I can encompass the universe. That's why we scream and spasm; it's too magnificent for the microcosm to endure. I've trained myself to recognize the epileptic type and every time I spot one I try to recruit him (or her) for the Group by killing them horribly, which is why they call me Grand Guignol. Bathsheba always sends me a Christmas card with a picture of an Iron Maiden.

That's not fair. I torture and kill from the best of motives, and if I describe my own experience with death you may understand. Back in 1883 I was an export factor, it says here, on Krakatoa, a volcanic island in the Sunda Straight. Krakatoa was listed officially as uninhabited and that was the swindle. I'd been established there secretly by a San Francisco firm in an attempt to muscle in on the Dutch trading monopoly. Did they say "muscle" back then? Wait a minute; I'll ask my goddam diary.

TERMINAL. READY?

READY. ENTER PROGRAM NUMBER.

001

SLANG PROGRAM HAS BEEN LOADED.

LOC. + NAME.

START COUNT 2000 N.P.

SLANG HAS FINISHED RUN.

MCS, PRINT. W. H. END.

NO.

So all right, they didn't say "muscle" back then, and happy birthday to IBM.

Now only an idiot would have

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taken the job, but I was a twenty-year-old kid intoxicated by the Discovery Mystique and mad to make a name for myself. Headline: NED CURZON DISCOVERS NORTH POLE!!! Like it was missing. Or Ned Curzon the African Explorer. "Dr. Livingstone, I presume?" Only, M'bantu says Stanley never said that, and I take M'bantu's word; he was there with a bindle on his head. Bindle? Bundle? McBee was there with a crate of four-buckle arctics on his head.

I was alone on the island in a bamboo warehouse with nothing but a terrier for company, but the locals sailed over to trade. They asked for the damnedest things and offered me the damnedest things, including their women who would bounce into bed for a gill of trade whisky. Ah! Those fabulous tropical beauties immortalized by Stanley! Not Sir Henry Morton Stanley of Africa; Darryl F. Stanley of Hollywood. Their skins were crocodiled with ceremonial scars and they cackled when you balled them, displaying teeth blackened by betel nut.

The natives knew that Krakatoa's Mt. Rakata was an active volcano, but it was so small, compared to the boss jobs on Java and Sumatra, that it never prevented them from visiting. Rakata would complain and steam up pumice occasionally but you got used to it. There were earthquake grumbles now and then, so slight that I could hardly distinguish them from the pounding of the surf. Even my idiot dog didn't have the sense to be alarmed. You know, the dumb friend barking to give warning of the unseen menace.

The big blowup came on August 26th and I did receive a rather odd warning. The day before, old Markoloua sailed over with his young men and women and a boatload of beche-de-mer which I loathe but the Inscrutables love. They cook with 'em. The locals were all chattering excitedly about fish. When I asked Markoloua what the fuss was, he told me that there were devils in the deep blue sea; when they landed on Krakatoa they were chased by great shoals of fish. I laughed at this and he led me to the beach and pointed. By God, he was telling the truth. The shore was littered with fish, gasping and flopping, and every comber brought in hundreds more, all of them bursting out of the water as though they were pursued by the devil.

Many years later I discussed this phenomenon with a vulcanologist at the Mt. Etna station. He explained that the heat building up at the base of Rakata must have spread across the ocean floor and raised the temperature so high that the fish were driven onto the land in their attempts to escape. That was much later. At the time I thought it was some sort of pollution.

Markoloua left, having traded

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the beche-de-mer for ten (10) tin mirrors. Next morning the first blowups came, four of them in succession, and it was the ending of the world. I didn't hear the noise, it was too loud to hear, I felt it, an acoustical battering that made me scream. The entire north end of the island went up in a mushroom of lava. The main cone of Rakata was split down the middle, exposing the central shaft. The sea poured into the molten interior, was instantly transformed into live steam and blew up in another series of explosions that crumbled the rest of the cone.

I was hammered by the noise, blinded by the smoke, suffocated by the livid vapors, slammed out of my senses, and there came that tidal wave of lava creeping toward me like a swarm of red hot caterpillars. I could feel nothing but the wild incredulity of death shocking my body. I *knew*. I knew what nobody believes until the extreme moment. I knew I was dead. And so I died.

Actually it was the vibrations of the explosions that performed the miracle. They burst the withes that bound the bamboo walls of my warehouse and twisted the stems into a birdcage, a log jam with myself inside incorporated with wooden debris; and then the quakes must have blasted me out into the ocean. I was not aware of it at the time; I only realized it later when I was reborn, floating in a caul of bamboo on the surface of the sea.

Krakatoa was gone. Everything was gone. There were new reefs thrusting up, black and stinking of sea bottom. There were black clouds of volcanic smoke and dust rumbling with thunder and lightning. I was in shock for five days which might have been five eternities until I was picked up by a Dutch freighter. They were sore as hell about the disaster which had delayed them by three days and acted as though it was all my fault, like I'd been playing with matches. That's the history of my death and the miracle that saved me. That's what turned me into a Molecular Man.

Now the hell of it is that it's pretty tough to arrange a volcano or a Black Death or a Hairy Mastodon when you want to recruit a man into immortality, and it's even tougher staging a miraculous save from the catastrophe. I'm pretty good at cruel killing but when it comes to the miracle I keep failing no matter how carefully I prepare. I did succeed with Sequoya, but I have to be honest and admit that the event was an accident.

Jacy is always pained when I call it a miracle. He spent a few months with me in Mexifornia and when I repeated my theory about what happened to the Group (the hell of longevity is that you get repetitious and garrulous) he said, "No. Miracles are the constituent

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elements in the divine revelation, deeds which display the divine character and purpose."

"Yes, yes, I know, Jace, and what could be the divine purpose in keeping the likes of me alive forever? All right, I'm the product of Nineteenth Century rationalism. Would you buy a rare coincidence of improbability and biochemistry?"

"You sound like Spinoza, Guig."

"Now that's a compliment. You ever meet him, Jace?"

"I bought a pair of spectacles from him in Amsterdam."

"What kind of a guy was he?"

"Splendid. He was the first to refuse to worship gods fashioned by men in their own image, to be servants of their human interests. That took courage in the 1600s."

At this point my own servant came in with refreshments; cognac for me, Romanee-Conti for Jacy who's been a wino ever since the Jerusalem days. The urchin was wearing a classic French maid's costume, something out of a movie from the archives. God knows where she dug it up. And then she had the impudence to wink at Jacy and say, "Hello. I'm your Bunny."

She flounced out. Jacy stared at me.

"She's always springing surprises on me," I said. "She tries to crunch my cool."

"She speaks XX."

"I taught her."

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"Does she know about the Group?"

"Not yet."

"What is a Bunny?"

"An antique waitress."

"But who is that child?"

"She adopted me and I can't get rid of her."

"Now Guig . . ."

"Would you like the whole story?"

"Of course."

"Well, I was editing *Dek Magazine,* freebie casettes full of comics and commercials, and, believe it or not, I got a letter. A *letter* in this day and age. I was absolutely flabbergasted, so I answered it. Wait a minute, I'll pull the entire correspondence out of my diary."

TERMINAL. READY?
READY. ENTER PROGRAM NUMBER.
147
FEE FILE HAS BEEN LOADED.
LOC. + NAME. START COUNT.
FEE FILE HAS FINISHED RUN.
MCS, PRINT. W. H. END.

The print-out rattled like a machine gun for a few minutes. I handed Jacy the length of tape, printed in XX, of course; I don't want outsiders reading my personal private diary. We'd both written in Spang but I translated us.

2 the edt. of Dekkk. I wish to rite a article on history of minor groups in cuntry like Indians & siberians who discover America in 1492 comeing over from Rusia on boats. Coloumbus was a liar. Truley yrs.

Fee-5 Grauman's Chinese
Mexiforn, USA

Dear Mr. Chinese:
Thank you so much for your interesting proposal. Unfortunately we feel that the subject is not suited to the editorial policy of *Dek* which is entirely dedicated to comics, commercials, sex and sadism.

Most sincerely,
The Editors

Two edtrs. *Dec.* Your ansr irellevant. Indians and eskimos minor groups been put down in U. S. of A. since 1492. You robing them of man hood 320 yrs. Make them 2rd class citysens. Gen. Custer got what was comeing to him.

Fee-5 Grauman's Chinese
Mexiforn

Dear Mr. Chinese:
Subtracting 1492 from 2080 gives *us* 588 years. What happened to your other 268 years, or will that be part of your proposed article?

Most sincerely,
The Editors

Edtrs of *Dk.* Nomber is irelivant. You don't do something

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too wipe out injustice to grt indians who make U. Spangland of A. grt proves you not relateing 2 valus for meanful dialg and our MSs will confront you.

Fee-5 Grauman's Chinese

Dear Mr. Chinese:
What is MSs? Is it the abbreviation for "manuscripts"? We must warn you that *Dek* will only consider one submission at a time.

Most sincerely,
The Editors

Rottn establish mint edtrs. Not MSS. MMS. Stands for militantes for more militante socity. We take over yr office. We throw you out. We sit in foreverr. Bring p-nut butter & jelli sandwich & sleep on floor.

Fee-5 (mad)

Dear Mr. Fee:
Could you give us some idea of when your militant organization will take over our offices? We'd like the chance to clear out in advance. You see, we're on the twentieth floor, so we can't go through the windows like deans and faculty members.

Most sincerely,
The Editors

You think MMS gone give you warneing in advance so cort orders & police pigs can comit fashist brutality? We confront you when MMS decide & if no meanful dialog you go out windows we don't care if even 268 floors hi.

Fee-5
(Pres. MMS)

Dear President Fee:
Is that what happened to your missing 268?

Most sincerely,
The Editors

O Kay. You regect demacratic prosiss. You force MmS to take militante actions for militante soceyety & indians

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& eskimos & 100% minor groups will arise.

Beware

That was the end. Jacy looked at me in such perplexity that I had to laugh. "She showed up all right," I said. "Ten years old, militant as hell, and we fed her so many peanut butter and jelly sandwiches that she got sick and I had to take her home. Now I can't dump her."

"How long has she been here?"

"Three years."

"But has she no family?"

"They were happy to get rid of her. They're just average goons and this kid upset them. She's a *lusus naturae,* a freak, a sport. She actually taught herself to read and write. There's no end to her talent."

"What does she do here?"

"Makes herself useful."

"Guig!"

"No, no. She's only thirteen. Too young for me. It's not what you think, Jacy. For shame."

"I do not apologize. I know your reputation. You live entirely for pleasure."

Mind you, this to me who'd cleared every woman out of the house for the Visitation. That's the trouble with these dedicated reformers; they're wonderful guys but they have no sense of humor. Scented Song says that Confucius was exactly like Jacy, always serious. Sheba says the same thing about Muhammad; you could stand all that earnest wisdom for just about an hour and then you had to sneak out for a few laughs. None of us ever dated Moses but I'll bet he was the same.

This is what got Jacy into trouble, but I'm not complaining because that's how I met my first successful recruit. The bods at Union Carbide, our local university, were mounting their ritual protest. It was the traditional daily rioting with screamings, burnings and killings. The only thing that changed was the cause, and the pressure groups had to sign up months in advance for representation. Jacy said he was going down to the campus to see if he could stop it. He was all for the kids' goals but he didn't like their methods.

"You don't understand," I told him. "They love their tradition of death and destruction. They don't even ask what it's for. They're issued posters and scripts and then they have themselves an orgasm. The ones that have a death-wish are obliged."

"Destruction of any of God's work is an attempt to destroy God," he said earnestly.

"Maybe. Let's find out what they're destroying for today. Hey, Fee!"

Fee-5 came in, playing the vampire bit now. "Kiss me, my fool," she said and smote me across the chops with an artificial rose.

"Tune in. What's the riot about today?"

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She cocked her head and listened hard.

"What is she doing?" Jacy asked.

"Jacy, you live in the homes of our Group and you don't know what's going on in the crazy culture outside. It's a bugged and drugged world. Ninety percent of the bods have bugs implanted in their skulls in hospital when they're born. They're monitored constantly. The air is crisscrossed with thousands of broadcasts. Fee is unique. She can pick them up and sort them out without a receiver. Don't ask me how."

"Honk Lib," Fee-5 said.

"There you are," I said. "Would anybody in his right mind burn down a library for the sake of Honkies? There aren't a million pure whites left in the world, and most of them are Jukes and Kallikaks from inbreeding."

"Come here, my child," Jacy said.

Fee sank into his lap and kissed him seductively. He put his arms under the vampire to make her comfortable and instantly the scene was transformed into Michelangelo's "Pieta." That's Jacy's magic.

"Do you use drugs, my love?"

"No." She glared at me. "*He* won't let me."

"Do you want to?"

"No. They're ditt. Everybody else does."

"Then why are you angry with Guig?"

"Because he makes me do what he wants. I have no identity."

"Then why don't you leave him?"

"Because—" She was hung up. She fell back and regrouped. "Because I'm waiting for the day when I make him do what I want."

"Are you bugged, love?"

"No," I answered. "She was born in the gutter and she's never been in a hospital. She's clean."

"I was born in the fifth row from the front in Grauman's Chinese," Fee said with enormous dignity.

"Good heavens! Why?"

"That's where my family lives," Fee said reasonably.

Jacy looked at me in bewilderment.

"She's stuck up because her family made it down to the orchestra from the balcony," I *esplained.*

He gave up, kissed Fee and disengaged himself. She actually clung to him for a moment before letting go. Charisma. He asked Fee if the riot had started and she said yes, half the fuzz were picking up the bug broadcasts and sounded irritated with it. They were getting bored with the repetitions. One of them was suggesting sending in an *agent provocateur* to incite a more entertaining sort of riot.

So off Jacy went, the dearest Knish-head I've ever known. He still wore the longish hair and the beard and still looked his Mole age, thirtyish, so I thought that would make him safe but I followed all the same, just in case. I

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didn't think the bods would hurt him but the fuzz might try to incite him to a more entertaining riot. He was capable of it. Nobody's ever forgotten the brouhaha he started in that temple in Jerusalem.

The campus was the traditional mess; missiles, lasers, fire-bombs and burnings, so everybody was happy. They were chanting and shouting jingles, "One, two, three, four," and something that rhymed with four. "Five, six, seven, eight," and another rhyme with eight. They couldn't go much higher because arithmetic was no longer compulsory. The guards were maintaining the ritualistic barrier lines and haggling with each other for the right to arrest and rape the prettiest girls. Crazy Jacy marched right into the middle of the ceremony.

I thought, "It's going to be another Sermon on the Mount and I didn't bring a recorder."

He never got the chance to adjure them. About twenty militants attacked an innocent parked chopper that was doing nobody any harm. They rocked it. They turned it on its side. They smashed the vanes and landing gear off and tried to hammer the cabin off the chassis. They rocked it some more, trying to overturn it completely, and they must have rocked too hard in the wrong direction. The wreck slammed down upright, directly on top of Jacy.

I ran to it. There were half a dozen dull thunks and there was gas (laced with LSD today) and the kids stopped cold and took in deep breaths. I was gassed too but I reached the chopper and tried to heave it up. Impossible. Three guards materialized and grabbed me.

"Help me get this up," I choked. "There's a man underneath."

We all heaved together. Nothing. Then a tall guy, long-boned, with deep-set eyes and a coppery complexion appeared, grabbed the edge of the frame and turned it over. Christ went up with it, crucified by the chassis, and that's how I met my first successful candidate for eternity.

2

He was the epileptic type, I was positive the moment I saw him. A lovely candidate; big, rangy, strong. He carried the Knish to the university hospital slung over one shoulder. Jacy was groaning in Aramaic, the language he learned at his mother's knee. In Emergency my guy was treated with great respect. It was, "Yes, Doctor (*Yassuh, Medico*), no, Doctor, certainly, Doctor." I figured he must have done something sensational like reviving cancer to combat the pop. ex. Good. A genius, too.

We saw Jacy into a bed. I wasn't worried about him; it takes more than minor injuries to endanger a Moleman, but I was terrified by the possibility of Lepcer. That's the

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real, the constant peril. More about Lepcer later. I whispered to Jacy, "I've registered you as J. Kristman. Don't fret. I put me down as next of kin and I'll take care of you."

My guy said in XX, "Hey, man, you speak Early English. How come?"

I said, "How come, you?"

"Maybe someday I'll tell you."

"Likewise, I'm sure. Could you stand a drink?"

"Any time, but I'm not allowed Firewater. I'm a ward of the state."

"Easy. I'll order and you sneak it. What am I drinking?"

"Firewater."

"You mean there's such a thing?"

His face was wooden. "Do I look like the joking type?"

"You look like something in front of a cigar store."

"Is there such a thing?"

"There used to be. Where are we drinking?"

"The Passionate Input. I'll show you."

It was a typical campus trap: spaced-out psychedelia, a mooing orgasm tape, tripping bods on the floor blown out of their minds, projection commercials standing around like realsies. "Hello," a jolly giant was saying. "I'm your friendly recycling bank. In our friendly efforts to conserve ecology we want you to let us recycle your money which—" We walked through him and went to the empty bar.

"Double Firewater," I said. "Double soda for my friend."

"Gas in the soda?" the bar wanted to know. "Hash? Phet? Sub?"

"Just plain soda. He trips on it." All this in Spanglish, *you unnastand.* So it was a double Fire and a double soda and the glasses got kind of intertwined like the frames on the floor. But I tried the Firewater and nearly had a convulsion.

"I nearly had a convulsion," I said.

"You did," he said. "It's the strychnine we put in. The palefaces love it."

"What d'you mean, 'we'?"

"We moonshine it on the Erie reservation and sell it to the palefaces. Quite a switch, isn't it? That's how we got rich. Firewater and Ugly Poppies."

"I'll figure that one out later. I'm Prince. Ned Prince. Who you?"

"Guess."

"Sure, but give me a hint."

"No, no. That's my name. Guess." He gave me a deadpan glance. "Haven't you ever heard about the late, great George Guess?"

"You?"

"My ancestor. That was the name the palefaces gave him. His real name was Sequoya."

"Named after the tree?"

"They named the tree after him."

I whistled. "He was that famous? What for?"

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"He was the great Indian scholar. Among other things, he invented the Cherokee alphabet."

"You're Dr. Guess?"

"R."

"Physician?"

"Physicist, but they're practically the same thing today."

"Here at Union Carbide?"

"I teach here. I do my real work at JPL."

"The Jet Propulsion Lab? What's the real work?"

"I'm project scientist on the Pluto Mission."

I whistled again. No wonder it was yes, Doctor, no, Doctor, certainly, Doctor. This genius was spending like a million a day in one of the most highly publicized NASA missions in history, financed by the United Conglomerate Fund in their friendly efforts to make the Solar System a better place for deserving developers.

"Sounds to me like the state is your ward, Guess. Am I thirsty again?"

"Yeah."

"This time let me have half. That strych grows on you."

"Hell, dude, I was just putting you on. All that went out ages ago."

"Did it? I'm loose in the memory. Hey, bar. Two double Fires. You got a front name, Guess?"

"I'm S. Guess."

"S for Sam?"

"No."

"Saul? Sol? Stan? Salvarsan?"

He laughed, and you haven't lived until you've seen a pokerface laugh. "You're all right, Prince. Why in hell did your friend get mixed up in that silly brawl?"

"He always does; he won't learn. Why in hell won't you tell me your name?"

"What difference does it make? Call me Doc."

"I can look you up in the U-Con stockholder reports."

"No you can't. I'm always S. Guess, PhD. Bar! Two more. On me."

The bar objected to excessive alcohol and suggested we switch to something respectable like mescaline, so we obliged. A dead ringer for Columbus, including spyglass, shot up through the floor. "Friends, have you ever considered what would happen to know-how without wherewithal? Give generously to the Industrial Research Foundation by buying the products we endorse: Meegs, Gigs, Poons, Fubs—"

We ignored it. "If I show you my passport," I said, "will you show me yours?"

"Haven't got one. You don't need a passport for space. Yet."

"Don't you travel?"

"They won't let me out of Mexifornia, officially."

"Are you that special?"

"I know too much. They're afraid I may fall into the wrong hands. Con Ed tried to kidnap me last year."

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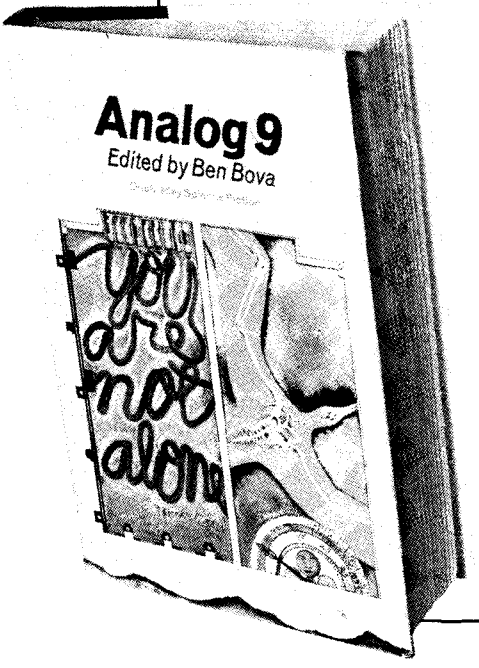

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"I can't stand the torture any longer. I'm really a spy for AT&T. In drag. My real name is Nellie."

He laughed again, still deadpan. "You're all right, Nellie. I'm pure Cherokee."

"Nobody's pure anything these days."

"I am. My mother named me Sequoya."

"No wonder you're hiding the name. Why'd she play a dirty trick like that on you?"

"She's romantic. She wants me to remember that I'm the twentieth in direct descent from the mighty Chief."

Fee-5 came into the trap, playing the intellectual bit now; hornrim spectacles without lenses, stark naked and covered with spray-can graffiti, applied by herself.

"What's this thing selling?" Guess asked.

"No, she's a realsie."

"Gas," Fee told the bar and turned great dark eyes on us. "*Benny Diaz, gemmum.*"

"It's all right, Fee. He speaks XX. An educated type. This is Dr. Sequoya Guess. You can call him Chief. Chief, this is Fee-5 Grauman's Chinese. Talk about names!"

"Great grief is a divine and terrible radiance which transforms the wretched," Fee said in somber tones.

"What is it and what's it grieving for?" Sequoya wanted to know.

"Could be anyone. Newton, Dryden, Bix, Von Neumann, Heinlein. You name it. She's my girl-Friday."

"Also Saturday, Sunday, Monday, Tuesday, Wednesday and Thursday," Fee said, belting down her Gas. She pierced the Chief with a clinical look. "You want to fondle my boozalum," she said. "Go ahead. Don't deny your manhood."

Sequoya pulled off her spectacles and perched them on one of her boozalums which were recent and a source of great pride. "That one's a little cockeyed," he said. "What kind of name is Fee?" he asked me. "Short for Fee-Fie-Fo-Fum?"

"Short for Fee-mally."

"Short for female," Fee corrected with great dignity.

The Chief shook his head. "I think I'd better go back to JPL. At least the machines make sense there."

"No, no. It makes sense. When she was born—"

"In the *orchestra* of Grauman's." Very proud.

"Her dumb mother couldn't think of a name, so the demographer listed her as Female. The mother liked it and called her Fee-mally. She calls herself Fee-5."

"Why the five?"

"Because," Fee explained patiently, "I was born in the fifth row. Any fool would understand that, but against stupidity the very gods themselves contend in vain. Gas!"

A capsule floated down on top of

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the bods with its jets spraying fireworks. A blue-eyed blond astronaut stepped out and came up to us. "*Duh,*" he mumbled in Kalikak. "*Duh-duh-duh-duh* . . ."

"What's this thing selling?" Uncas asked.

"*Duh,*" Fee told him. "That's about all the Honks can say, so they named the product after it. I think it's a penis amplifier."

"How old is this kid?" Sequoya demanded.

"Thirteen."

"She's too young for her frame of reference. Next you'll be telling me she can count."

"Oh, she can, she can. She can do anything. She picks it up from the bug broadcasts. This brat is picking all the brains on Earth by ear."

"How?"

"I don't know."

"Probably some sort of interface." The Chief produced an otoscope from the interior of his *tutta.* I had a glimpse and the interior looked like a portable laboratory. "Let me have a look, Fee-Fie-Fo." She presented an ear obediently and he had his look. He grunted. "Fantastic. She's got a freak canal structure and there's an otolith in there that looks like a transponder."

"When I die," Fee said, "I'll leave my ears to science."

"What's the Fraunhofer wavelength of calcium?" he shot.

She cocked her head. "Well?" he asked after a short pause.

"I've got to find somebody who's talking about it. Wait for it . . . Wait for it . . . Wait for it . . ."

"What do you hear when you listen?"

"Like the wind in a thousand wires. Ah! Here it is: 3968 Angströms, in the extreme violet."

"This kid is a treasure."

"Don't flatter her. She's vain enough as it is."

"I want her. I can use her at JPL. She'll make an ideal assistant."

"You're not bugged," Fee told him, "and you're not being monitored. Did you know?"

"Yes, I know," he said. "I suppose you are."

"No," I said. "Fee and I aren't bugged because we've never been in a hospital. She was born in a movie house and I was born in a volcano."

"I'm going back to JPL," he muttered. "You're all scrambled around here. Will you let her come and work for me?"

"If you can stand her, but she's got to come home nights. I'm raising her old-fashioned. You're not really serious about this, are you, Geronimo?"

"Damn serious. I won't have to waste time teaching her the things an assistant ought to know. She can pick everything up reading the bugs. The people I've had to fire for illiteracy. Education in Spangland! Pfui!"

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"So where were you educated that makes you so literate?"

"On the reservation," he said grimly. "Indians are traditional. We still revere Sequoya and we've got the best schools in the world." He groped inside the inexhaustible tutta, produced a silver medallion and handed it to Fee. "Wear this when you come to JPL. It opens the front gate. You'll find me in the Cryonics Section. Better wear something. It's damned cold."

"Russian sable," Fee said.

"Does that mean she's going to come?"

"If she wants to and if you pay my price."

He took the spectacles off her chest. "Oh, she wants to. She's been batting her cockeyed boozalums at me without success and she never gives up."

"I've been rejected by better men than you," Fee said indignantly.

"So what's your price, Ned?"

"Sell me your soul," I said.

"Hell, you can have it for free if you can get it back from United Conglomerate."

"Let's have dinner first. The only question is, do we feed the girls before or after?"

"Me! Me! Me!" Fee cried. "I want to be one of the girls."

"Virgins are so pushy," I said.

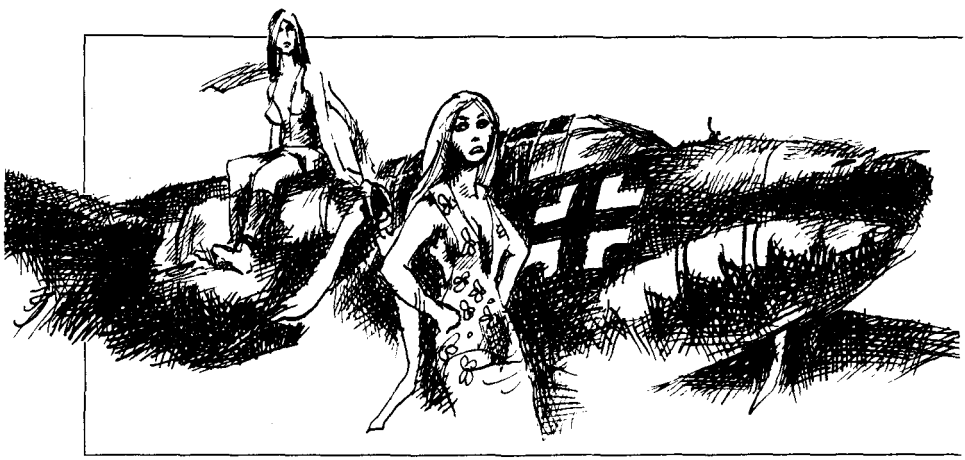
"I was raped when I was five."

"The wish is father to the thought, Fee."

"Who said that?" Montezuma shot at her. "Well . . .?"

"Shush. Shush. Shush. Nobody's talking about—Ah! Got it. Shakespeare. Henry IV."

"It's the Jung caper," Guess said in awe. "She can tap the collective conscious of the world. I've got to have her."



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"If I come to JPL will you pay *my* price?"

"What is it?"

"Criminal assault."

He looked at me. I winked at him.

"All right, Fee, and I'll make it real criminal; inside the centrifuge at 1,000 rpm, in the vacuum chamber at half a millimeter of mercury, in one of the cryonics coffins with the lid on. It's a promise."

"There! See?" she threw at me, as triumphant as she was eight months back when her boobs jumped up.

"I never thought you were such a conformist, Fee-doll. Now go to the hospital and comfort Jacy. He's registered as J. Kristman. Tell them you're the confidential assistant of Dr. Guess and they'll bow from the waist."

"Eight o'clock tomorrow morning, Fee-Fie. If it's a deal."

She stuck out a paw and slapped hands. "It's a deal," she said and walked out through Louis Pasteur who was waving test-tubes and selling an anti-mugging nostrum.

We picked up a couple of girls who claimed they were co-eds and might well have been; one of them could recite the alphabet all the way to *L*. The only problem was how to stop her from reciting. A showoff. We took them to Powhatan's pad which really was impressive, an enormous tepee guarded by three very unfriendly timber wolves. When we got inside I understood the reason for the security; it was decorated with some of the most beautiful Indian art I've ever seen in my life, all museum pieces.

We swapped the girls a couple of times and then Guess cooked us a traditional Cherokee dinner in a huge thermal stewpot: rabbit, squirrel, onions, peppers, tomatoes, corn and lima beans. He called it *misquatash*. I took the girls home, they were living in the fuselage of a Messerschmitt in a TV prop dump, and then I called Pepys in Paris.

"Sam, it's Guig. All right if I project?"

"Come on in, Guig."

So I projected. He was having breakfast in the bright morning sun. You'd think that being the Group historian he'd identify with someone like Tacitus or Gibbon but no, it was Balzac, complete with monk's drag. We're all a little loose.

"Good to see you, Guig. Sit down and join me." Joke. When you project you're only two-dimensional and you ooze through furniture and floors if you don't keep moving, so I kept moving. It was like walking through slush.

"Sam, I've got another candidate, a beauty this time. Let me tell you about him."

I described Sequoya. Sam nodded appreciatively. "Sounds perfect, Guig. What's the problem?"

"Me. I don't trust myself any-

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more; I've failed too often. I swear if I fail with Rain-In-The-Face I'm going to quit for good."

"Then we must make sure you don't fail."

"Which is why I'm here. I'm afraid to try it on my own. I want the Group to pitch in and help me."

"Murder a man. Hm-m-m. But what's your plan?"

"I haven't got any. I'm asking the Group to come up with horror suggestions and then come out and work with me."

"Watch yourself, Guig, you're knee-deep in the fireplace. Now let me get this straight. You want to use the Grand Guignol technique on Guess and you're asking the Group for ideas, aid and comfort."

"That's it, Sam."

"Some don't approve."

"I know."

"And some don't believe."

"I know that, too, but some have an open mind. They're the ones I want to tap."

"You're sliding into the piano, Guig. Then this is going to be your final supererogon, and we can't let you down. God knows, a man of the stature of Dr. Guess would be a tremendous asset to the Group. I've always agreed that we need new blood. I'll pass the word on the grapevine. You'll be hearing from us."

"Thanks, Sam. I knew I could depend on you."

"Don't go yet. I'm a month behind on your shenanigans. What have you been up to?"

"I'll beam you a print-out from my diary. The usual channel?"

"Yes. And what about that remarkable child, Fee-5? Should we plan a recruitment for her, Guig?"

I stared at him, absolutely speechless. It had never occurred to me, and my instantaneous reaction was to shake my head.

"But why not, Guig? She sounds as tremendous as Dr. Guess."

"I don't know," I mumbled. "*'Revoir*, Sam," and I retrojected.

Confusions and upsetments. I went to her room to have a look at her. She was sleeping in a white coverall, scrubbed and polished, her hair skinned back, and she had a lunch packed and waiting. All set for the big new job. I inspected the lunch; enough for two including a kilo of my private caviar from the St. Lawrence hatchery. Hm-m-m.

Her bed was murmuring, "The vacuum-insulated cryogenic tank at the United Conglomerate JPL Space Center contains 900,000 gallons of liquid hydrogen for fueling the Pluto Mission rockets. In terms of energy its contents are equivalent to . . ." *u.s.w.* Boning up to make herself worthy of Sitting Bull. Hm-m-m.

I went to the study for a rap with my diary. I had to know what was wrong with me. Was I overprotective? Was I afraid of her? Did I hate her? Did she hate me?

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Was I rejecting the prospect of knowing her forever?

TERMINAL. READY?
READY. ENTER PROGRAM NUMBER.
NEW PROGRAM. CODE 1001.
DESCRIBE PARAMETERS.
USE ALL RELATIONS BETWEEN FEE-5 AND TERMINAL AS FIXED POINT AND FLOATING POINT VARIABLES.
STATE ARGUMENT MODE.
ARE FEE-5 AND TERMINAL MEMBERS OF SAME SET?
CODE 1001 HAS BEEN LOADED.
LOC. + CODE. START COUNT.

It took like ten minutes, and when you translate that into nanoseconds there aren't enough zeros to go around.

CODE 1001 HAS FINISHED RUN.
MCS, PRINT. W. H. END.

The print-out cackled: WITHIN MATHEMATICAL PARAMETERS FEE-5 $\neq$ TERMINAL. WITHIN EMOTIONAL PARAMETERS FEE-5 = TERMINAL.

"Emotional!" I hollered at the goddam diary. "What's that got to do with it?" and I went to bed (mad).

I chopped her down to JPL next morning where they wouldn't let me through the main gate and she gave me a triumphant look as she sashayed in. I looked around. I remembered it from the days when it was just a scrubby hill scarred with a few burns where Cal Tech undergraduates had been playing with baby rockets. Now it was a complex so gigantic that JPL was threatening to secede from Mexifornia and go into business for itself.

After a few hours with Jacy at the university hospital (doing fine) and watching the campus riot (anti-motherhood) I got home just in time to open the door for an enormous figure in an antique rubber diver's suit. "I'm not buying anything today," I said and started to shut the door. It opened the faceplate of the helmet and about a gallon of seawater gushed out. "Guig! I'm here to help you," it said in XX.

It was Captain Nemo, who's been cracked on marine research so long that he prefers to live in water. He turned and waved his arms. "Bring her in, lads," he shouted in Spanglish and a little more water squirted out of his helmet. Three goons appeared lugging an enormous vat which they carried into the house. "Set her down easy," Nemo admonished. "Easy, lads. Easy. That's it. Avast. Belay." The goons left. Nemo took off the helmet and beamed at me, his whiskers dripping. "I've got all your problems solved, Guig. Meet Laura."

"Laura?"

"Look in the tank."

I took the lid off and looked. I was face-to-face with the goddam biggest octopus in history.

"This is Laura?"

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"My pride and joy. Say hello to her."

"Hello, Laura."

"No, no, Guig. She can't hear you from out here. Stick your head under the water."

I stuck. "Hello, Laura," I bubbled.

Damn if the beak didn't open and I heard, "Herro," and the eyes stared at me.

"Can you say your name, love?"

"Raura."

I pulled out and turned to Captain Nemo, who was bursting with pride. "Well?"

"Fantastic."

"She's brilliant. She has a vocabulary of a hundred words."

"She seems to have a Japanese accent."

"Yes. I had a little trouble with the mouth transplant."

"Transplant?"

"Well, you don't think I found a thinking, talking octopus, do you? I created her with transplants."

"Nemo, you're a genius."

"I admit it," he admitted modestly.

"And Laura's going to help me put the squeeze on Sequoya Guess?"

"She can't miss. We tell her what to do and your man will die so horribly that he'll never forgive you."

"What's your plan?"

"Have you got a pool? I'm beginning to dry out."

"No, but I can fake one."

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I sprayed the little drawing room with transparent perspex, about six feet up the wall, the floor and furniture too, of course, making the coat two inches thick, and there was a drawing-room-shaped pool including the decor. I filled it from the main pump. Nemo got out of his suit, went into the living room and came back with Laura in his arms. They got into the pool and Nemo sat down on the couch and breathed a bubble of relief while Laura explored curiously. Then Nemo motioned for me to join them. I joined. Laura wrapped her arms around me affectionately.

"She likes you," Nemo said.

"That's nice. So what's your hideous plan?"

"We take your man aqualung diving. We take him deep. He'll have a closed atmospheric system with a high-pressure helium-oxygen gas mixture. The helium is for the bends."

"Yes?"

"Laura attacks. The monster from the deep."

"And drowns him?"

"No, no, no, lad. More fiendish than that. Laura has been briefed. She cuts off the helium input while he's struggling."

"So? He's getting pure oxygen."

"That's what makes it fiendish. Oxygen, under high pressure, produces symptoms of tetanus, strychnine poisoning and epileptic spasms. It exaggerates the excitomotor power output of the spinal cord and creates violent convulsions. Your man will go under in slow agony."

"It sounds ghastly enough, Nemo, but how do we save him?"

"Chloroform."

"With what!"

"Chloroform. That's the antidote for oxygen poisoning."

I thought it over. "It sounds kind of complicated, Nemo."

"What d'you want, a volcano?" he said angrily.

"Sorry. Sorry. I just want to be sure it'll work this time. We'll try it, Nemo. We– Wait a minute. I hear a godawful pounding on the front door."

I climbed out and went to the front door, forgetting I was naked. When I irised it open, there was Scented Song, looking as ever like a Ming Dynasty princess. There was an elephant behind her hammering at the door with its trunk.

"The vision of your godlike presence lends celestial light to these concave and unworthy eyes," she said. "All right, Sabu, knock it off."

The elephant stopped hammering. "Hi, Guig," she said. "Long time no see. Don't look now, but your fly's open."

I kissed her. "Come in, princess. It has been a long time, hasn't it? Too long. Who's your friend?"

"About as close as I could come to a mastodon."

"You don't mean . . .?"

"What else? If it was good

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enough for Hic-Haec-Hoc it ought to be good enough for your prospect."

"What did you have in mind?"

"I seduce your jewel of a thousand facets. While we're in the act we're caught *flagrante* by Dumbo who, in a mad passion of insensate jealousy, sl-o-w-ly crushes us to death. I scream, but it's no use. It's mad, do you hear? Mad. Your guy fights heroically, but the massive forehead presses down and down and down . . ."

"Jeez," I said appreciatively.

"And speaking of Sabu's massive brain, we'd better bring him in. He's not very bright and he may get himself into trouble. Iris a little wider for him, Guig."

I opened the door wider and the princess motioned the road-company mastodon in. I have to admit he couldn't be very bright. In the few minutes that he'd been left alone he'd permitted himself to be covered with spray-can graffiti, all unmistakably obscene. Sabu chirped a little, touched Scented Song with his trunk to reassure himself, and then disappeared as the living room floor collapsed under him with a roar. There he was, down in the basement, trumpeting his fool head off. There were more roars from the drawing room.

"They don't build houses like they used to," the princess said. "What's all that hollering?"

I didn't have to *esplain.* Captain Nemo came charging out with his fly open. "God damn it, what the hell's going on? Ahoy, princess. You've scared the living daylights out of Laura, Guig. She's in a red panic. She's a very sensitive girl."

"It wasn't me, Nemo, it was Sabu. He fell down a little."

Nemo looked down into the basement. "What is it?"

"A Hairy Mastodon," I said.

"I don't see any hair."

"I shave him every morning," Scented Song said. She seemed a little miffed and I suspected there was going to be rivalry between Sabu and Laura. There was a scratching on the front door. When I opened it I was confronted by a coiled python standing seven feet high.

"No rabbits today," I said. "Come back tomorrow."

"He does not swallow rabbits," a familiar voice said with meticulous diction. "He swallows men."

Long fingers separated two coils and there was M'bantu surrounded by python, smiling at me.

"My favorite Zulu. Come in, McBee. Bring your friend, unless he's shy."

"He is not shy, Guig. He is asleep. He will sleep for ten days and then he will be ready for your Dr. Guess. Good afternoon, princess. Captain Nemo. What a pleasant reunion."

Both of them sniffed and didn't bother to conceal it. More rivalry. I was warmed by the way the Group was rallying 'round, but oh! the

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competition. M'bantu unwrapped the python, which was like fifteen feet long, and draped it gently around one of the archway pillars. It went right on sleeping.

"What's that bulge in its middle?" Nemo demanded.

"Breakfast," McBee said courteously, not going into details.

"Does it like fish?"

"Probably prefers elephants," Scented Song said. "It's big enough."

"The next meal will be Dr. Sequoya Guess. That is, with your permission, Guig," M'bantu said pleasantly. "He will die most painfully, but what will be even more painful for me will be the sacrifice of my friend to save the doctor. However, *che sera sera.*"

The front door burst wide with a blaze of sparks and Edison marched in, carrying his toolbox. "Told you these magnetic locks can't hold, Guig," he snapped. "How much electric power does this sachem have in his house? Princess. Nemo. M'bantu. Well?"

"None," I said. "He lives in a tepee. Strictly Indian style. Thanks for coming, Ed."

"Then we'll have to get him here. You've got power?"

"I can deliver ten kilowatts."

"Plenty. You've always been behind the times?"

"Conservative. Yes."

"Conservative kitchen?"

"Yes."

"Conservative oven?"

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"The old-fashioned walk-in type. Yes."

"Perfect. That's how we'll get him." Edison opened his toolbox and yanked out a blueprint. "Look at this."

"Just tell us, Ed."

"We rewire it, power it, turn it into a magnetic induction furnace."

"What's that?"

"It melts metal; nothing else. Only conductive metals. Understand?"

"So far."

"Put in your hand and you feel nothing. But if you've got a ring on your finger, the ring will melt and burn your finger off. Induction."

"Phew. That sounds grisly."

"Doesn't it. Get the Indian into your oven. We start the induction slow and the torture begins."

"You mean his fingers burn off?"

"No. The brain begins to burn. Bugged, isn't he?"

"No."

"Bugs are platinum. Platinum is conductive. QED."

At this point the other three, who had been listening, utterly fascinated, burst out laughing. They shrieked and rocked helplessly while Edison glared at them. It looked as though this loyal rally was going to turn into a Donnybrook Fair and I'd get nowhere with the murder of Sequoya. I was wondering how to make peace when Fee-5, bless her, called and asked if she could project. I said to come ahead and there she was in a starched white lab coat looking every inch the dedicated young scientist.

"He wants you to come to JPL right away," she burst out excitedly. Then she looked around. "Oh, sorry, cats. I didn't know there was company. Am I intruding?" still in XX.

"All gung, Fee. All friends. As a matter of fact we were just discussing the Chief. Now what's all this?"

"There's an elephant in the cellar. Did you know?"

"Yes, we know."

"And a snake up there."

"We know. Also an octopus in the drawing room. Why does Dr. Guess want me to come to JPL right away?"

She took fire again. "The event of the century. The experimental cryocapsule will put down in an hour. Three cryonauts have been out in orbit for three months and now they're putting down. All the celebs from U-Con will be there and the Chief wants you, too."

"Why me? I'm not celebrated. I don't even own any stock in United Conglomerate."

"He likes you. I don't know why. Nobody else does."

"Well, ask him if I can bring four friends."

Fee nodded and retro'd. The others protested that they weren't faintly interested in the event of the century; they'd witnessed too many in their time and they were

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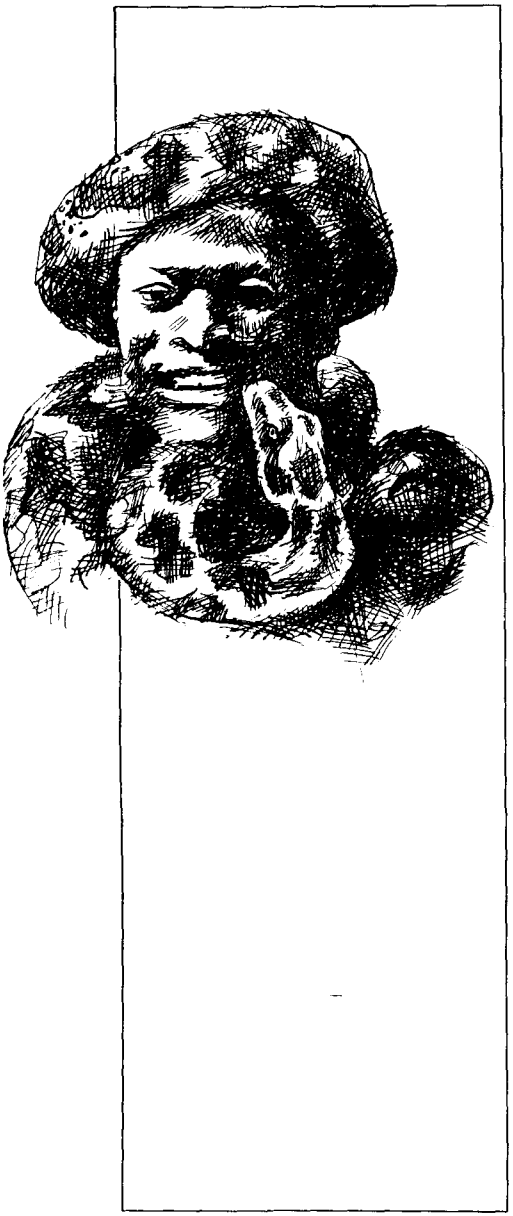

always a let-down. All of them began bitching simultaneously; about the Boxer rebellion, Franklin and his kite, Captain Bligh and the *Bounty*, Henry Christophe. I tried to break it up. "You don't understand," I told them. "I couldn't care less about those frozen characters coming in for a landing, but this is a golden opportunity to case the guy we're going to kill. Don't you want to size up your victim?"

Fee reappeared. "It's gung, Guig. He says the more the merrier. You can bring the elephant if you like. I'll meet you at the front gate and pass you in." She disappeared.

As we trooped up to the roof (elephant not included) to get into the big chopper, they were all delivering asides.

"Who is she?"

"Sam says he's had her for three years."

"One of yours. M'bantu?"

"Alas. I would say not. She is too light. Most probably Maori and Aztec Indian with a strong strain of Honk. It's the touch of the Waspbrush that accounts for the delicate bones."

"Guig always likes them exotic."

"Behind the times all his life."

"She is pretty."

"And as nubile as a young dolphin."

"I wonder how many he's scored."

"Sam would know."

I was delivering a few asides to myself: How the hell did Fee-5

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know my guests understood XX? I had the uneasy feeling that there was a lot more I didn't know about Fee. I also had a sinking that this Cherokee caper was going to turn into the wrong kind of catastrophe. I wanted to go to the university hospital and ask Jacy to move over.

3.

We were mugged by some senior citizens on the way from the chopper to the main gate, but no great harm done; they were using vintage revolvers. There was one funny incident. After we chased them I looked around and there was Nemo kneeling on a prostrate maladroit and sincere as hell. He was slamming the goon across the face with his own pistol and chanting in rhythm, "This is not . . . the road to . . . survival . . . You must . . . transplant . . . transplant . . . transplant . . ."

We pulled him off the poor old Shortie and were met at the gate by Fee who seemed rather impressed by Nemo's performance. Muggings she knew all about, but this was the first time she'd ever seen one used as an excuse for a lecture. Fee conducted us to the landing site and it was my turn to be impressed.

It was an enormous theater-in-the-round with a circular stage. There were seats for a thousand in the round amphitheater, all filled with U-Con brass and politicos doing their best to keep JPL happy and paying taxes in the state. Fee seated us in the reserved section and went down to the floor to join Guess, who was standing at a huge control console alongside the stage. I thought she was behaving with poise and assurance. Either the Chief had kept his promise or she'd found her identity. Either way or both, I had to admire her.

Guess took stage-center, looked around and spoke. *"Senoras, gemmum, soul hermanos, ah gone esplain brief, you know, what this esperiment mean, dig? You got like any preguntas, right, ax da man."*

He motioned to Fee who did something at the console. Projectors flashed on and there were three bods on the stage alongside Guess, bowing and smiling. They were smallish but looked strong and tough.

"These are the three courageous volunteers," Guess said (in translation), "who have taken the first cryogenic flight in history. This is in preparation for the Pluto mission and eventually the stars. The constraints are time and payload. It will take the mission many years to reach Pluto, even at maximum acceleration. It will take centuries to reach the stars. It would be impossible to freight enough supplies for these men. There is only one answer, the cryonic technique."

He motioned to Fee again. The projectors flicked and there were the cryonauts, naked, being helped into transparent coffins by tech-

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nicians. Quick cuts of them being injected, variously attached to tendrils, given some sort of sterile wash. The coffin lids were bolted shut.

"We lowered the temperature in the cryocoffins one degree Celsius per hour and increased the pressure one atmosphere per hour until we produced the effect of Ice III, which is denser than water and forms above the freezing point. Mid-Twentieth Century cryonics failed because it was not known that suspended animation could not be achieved through freezing alone; it requires a combination of low temperature and high pressure. Details are in your fact-tapes."

Shot of the coffins being tenderly loaded into a capsule. Cut to the interior of the capsule and techs hooking up complicated plumbing.

"We launched them on a ninety-day orbit, a deep elipse." Long shot of the launch; a gentle liftoff and then, at altitude, flames roaring down from the rocket vehicle carrying the capsule, and acceleration to out-of-sight. The usual. Edison looked bored.

"Now they're returning. We'll trap the craft in a projected kinorep cone, center it with its lateral gas jets, and let the offset of kinorep and gravity bring it down slowly. For those of you who aren't tech-oriented, kinotrac and kinorep are our abbreviations for kinetic electromagnetic attraction and repulsion. That's how the craft you travel on take off and land without shaking you up.

"The cryonauts will arrive in about ten minutes and be brought up to normal metabolism so slowly that I'm afraid you'll have to wait a few days before interviewing them . . . not that they'll have much to tell you. For them, no time has passed at all. Now, are there any questions?"

There were some smart-ass questions from civilians: Where was the orbit of the capsule? (In the plane of the Earth's orbit. All in your fact-tapes.) Why not a comet orbit around the sun? (Refrigeration constraints plus the fact that it would be thrust into a no-return parabola. All in your fact-tapes.) What are the names and qualifications of the cryonauts? (All in your fact-tapes.) How do you personally feel about this dangerous experiment? (Accountable.) He looked around. "Three more minutes. Any further questions?"

"Yes," I called. "What's an Ugly Poppy?"

He gave me a look that made me feel for George Armstrong Custer (West Point, '61) and returned to the console. "Iris open," he ordered. Fee touched something and the entire roof above the stage leafed back. "Kino trap." She nodded, concentrating so hard that her teeth were fastened on the tip of her tongue.

We waited. We waited. We waited. There was a loud bleep

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from the console. "In contact," murmured Guess. He took the controls. "Each time the craft contacts the kinorep wall we reverse it with its lateral jets, trying to pin it to the center of the cone." He thought he was thinking out loud. In the anxious hush it sounded like a shout. His hands flicked over the console controls, and the bleeps merged into a sustained discord. "Centered and descending." It was obvious to me that Poker Face was under a tremendous strain even though he showed nothing. He began a droning count, "*Diez. Nuevo. Ocho. Siete. Seis. Cinco. Cuatro. Tres. Dos. Uno. Minuto.*" He was peering up through the iris and down at the console radar screen. He went on counting and it sounded like a Latin mass. What a hell of an accountability.

Then the ass-end of the capsule crept silently through the iris and inched down with the speed of a snail. We couldn't see the kinorep repulsion but it raised a small storm of dust and paper debris on the stage. There was cheering from the audience. Guess paid no attention; he was completely concentrated on the console controls and the capsule.

He nodded to Fee, who ran to the edge of the stage, knelt, and began making hand signals indicating how much farther the capsule had to drop. We knew it had landed when we saw the stage give slightly. Guess switched off the console, drew a deep, shuddering breath, and suddenly electrified us with a Comanche whoop. We all yelled and laughed and applauded; even Edison, who was consumed by professional jealousy.

Three techs, realsies this time, appeared and unsealed the capsule. Guess stepped to the hatch. "As I said, you won't be able to talk to them but you can look at them. Think of it. They won't be aware of any time-lapse." He poked his head into the hatch and his voice was muffled. "Frozen ninety days in orbit and—" He stopped abruptly. We waited. Nothing. He didn't speak; he didn't move. One of the techs touched his back. No response. The two others joined him, muttering anxiously, and then slowly pulled him back. He moved like a sleepwalker and when they let go he simply stood, frozen. The techs looked into the capsule and when their heads reappeared they were white and dumbfounded.

I had to see what'd happened. I scrambled with the crowd to the capsule. When I finally got a chance to look in, I saw the three coffins. There were no cryonauts inside. There was nothing inside the coffins except three pasty, naked rats. The mob pushed me aside. Through the bedlam I heard Fee-5 shrilling, "Guig! Here! Guig! Please! Guig!" She was alongside the console. I fought my way to her. She was standing over Guess, who was on the floor behind the

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console in the throes of a classic epileptic seizure.

"All right, Fee, I've got him." I did what had to be done. The tongue. The foam. Loosening the clothes. Easing the thrashing arms and legs. She was appalled; a seizure is always terrifying. Then I stood up and shouted, "Group! Here!" All four materialized. "Guard of honor," I said. "Don't let anyone see him. Are you in control, Fee?"

"No."

"Sorry. You'll have to be. Does the Chief have an office? Any private sanctum?" She nodded. "Good. Instructions: My friends will carry him. Show them where to take him. Then come right back. At once, understand? You'll have to front for Guess when the mob gets around to asking questions. I'll stand by you. My friends will stand by the Chief. Go!"

She was back in five minutes, out of breath, carrying a lab coat. "Put this on, Guig. You be one of his assistants."

"No. You'll have to do this on your own."

"But you'll stand by me?"

"I'm here."

"What do I do? What do I say? I'm not so smart."

"Yes you are, and I haven't trained you for three years for nothing. Now—with great assurance and great style—are you ready?"

"Not yet. Tell me what threw the Chief."

"The cryonauts aren't in their coffins. They've disappeared. There's nothing in each coffin but something that looks like a naked rat."

She began to shake. "Oh God! Oh God! Oh God!" I waited. This was no time to cosset her; she had to make it on her own. She made it. "Gung, Guig. I'm ready. What now?"

"Call for attention. Assurance and style. I'll cue you in."

By God, she had the style to climb up on the console and stand like stout Cortez having his first look at the Pacific. (While his men looked at each other with a wild surmise.) "Ladies and gentlemen!" she called in Spang. "Ladies and gentlemen! Your attention, please. (What now, Guig? in XX)"

"Identify yourself."

"I am Fee-5 Grauman's Chinese, the confidential assistant of Dr. Guess. I'm sure you saw me at the control console. (And now?)"

"Upbeat. Elegant. This isn't a disaster, it's a challenge."

"Ladies and gentlemen, something unusual has taken place in the course of our cryogenic probe, and you've been privileged to witness it. I congratulate you. It was unexpected but, as Dr. Guess says, that's the essence of discovery, to find what you're not looking for." She cocked her head. "Ah, some of you are saying serendipity. Yes, science is serendipity. (Guig!)"

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"The Chief is analyzing this surprise with his staff. Very technical here."

"Dr. Guess is with his staff now in a mode analysis of the phenomenon which you've all seen." She cocked an ear again. "Yes. I know what you're wondering; will we go ahead with normal procedure with the cryocoffins? Dr. Guess is evaluating that now, which is why he must not be disturbed. You're wondering what happened to the cryonauts. So are we. (Guig!)"

"That's all."

"Thank you very much. I must return to the staff conference now. Dr. Guess will issue a full status review as quickly as possible. Thank you."

I helped her down. She was trembling.

"You're not finished yet, Fee. Tell the techs to put a hold on the capsule just as it is. Seal it and maintain all systems as if it were still in orbit."

She nodded and fought her way through the crowd to the technical men who still looked dazed. She spoke to them urgently and then returned to me. "Now what?"

"First, I'm proud of you."

"F."

"Now take me to Sitting Bull. I've got to—"

"Don't call him that!" she screamed. "Don't call him any of those names. He's a great man. He's a . . . He's . . ."

"—brief him on the situation. He must be recovered from the attack by now."

"I think I love him." she said helplessly.

"And it hurts."

"It's awful."

"It always is, first time around. Let's go."

"Only twelve hours, Guig, and I feel twelve years older."

"I can see it. You've made a quantum jump. Let's go."

Sequoya's sanctum was a large conference room with a long table and heavy armchairs. It was cluttered with books, journals, tape cartridges, computer software. The walls were hung with ten-by-ten-foot orbit-tracking charts. The Group had seated Guess in a chair at the far end of the table and was eyeballing him with concern. I closed the door on the curious secretaries in the anteroom.

"How is he?" I asked.

"He has lost his marbles," M'bantu said.

"Oh, come on, McBee. He had a fit, that's all."

"Watch this," Scented Song said. She took Sequoya's hand and raised it high. When she let go, it remained where it was. She took Guess by the shoulders and gentled him out of the chair. The Chief came to his feet obediently. When the princess walked him around the conference room, he accompanied her like a sleepwalker, but when she released her hold, Sequoya came to a dead stop in midstride.

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His hand was still high in the air.

"This is a fit?" McBee asked.

"Put him back in his chair," I said. Fee was whimpering. I wasn't exactly joyful myself.

"It's a wash-out," Nemo said. "We'll never get to him."

"You've got to help him," Fee cried.

"We'll do our best, love."

"What's happened to him?"

"I don't know."

"How long will it last?"

"No idea."

"Is it permanent, Guig?"

"I couldn't say. We need an expert. Princess, call Sam Pepys. Borgia is to come to my house with all dispatch."

"Wilco."

"Why bother?" Edison wanted to know. "He's blown his fuses. Forget him."

"Out of the question. First, for Fee's sake. Second, he's still my candidate; we've got to bring his marbles back. Third, plain humanity; he's a brilliant guy and we've got to save his prestige."

"Just save him," Fee pleaded.

"We'll do our best, love. The first problem is how to get him out of here to my place. I can hear the U-Con stockholders clustering in the anteroom. How do we get him past them?"

"Moving him is no problem," McBee said. "He handles like a baby. We can walk him anywhere."

"But how do we make him invisible?" I thought hard. I'm sorry to say I was enjoying the crisis. I love a challenge. "Ed, what's your current identity?" Edison jerked his head at Fee. "Never mind her. We're beyond that."

"I know all about the Group," Fee said, not showing off, just trying to help.

"We'll discuss that later. Who are you nowadays, Ed?"

"Director of the RCA Plasma Division."

"Got identification on you?"

"Of course."

"Gung. Go out there. You're a distinguished colleague of Dr. Guess, who invited you to witness the event. You're fully prepared to discuss anything and everything with the stockholders. Fake it and don't stop faking until we've got the bod out of here."

Edison de- after giving each of us a sharp glance plus a long look at Guess- parted. I heard him start his spiel outside which sounded like, "$u(x + h) - u(x) = 2x + 1$." Most enlightening. I thought some more. "Fee and princess. Take the biggest chart off the wall. Each of you take a corner and hold it as high as you can." They obeyed without asking questions and I gave them good marks for that. "Hold it taut." The bottom of the chart just touched the floor. "McBee, you're the strongest. Put Guess over your shoulder."

"The hell he is," Nemo blurted.

"Only physically, Captain," M'bantu said in soothing tones.

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"Never intellectually. No one can compare to you in that department."

I plotted the scene for them and opened the door to the anteroom. The two women walked out holding the chart as high as they could reach. "Sorry to keep you waiting," Fee said to the assembled. Then they sailed the chart out of the anteroom. Behind the screen M'bantu was carrying Sequoya.

When we got to my place Borgia was waiting (I swear I never saw Scented Song making the call) looking like a Sicilian Florence Nightingale, which indeed she is; Sicilian, that is, not a nurse. She's the damned best doctor I know. Since 1600 she's taken medical degrees at Bologna, Heidelberg, Edinburgh, Salpetriere, Cornell and Standard Oil. Borgia believes in keeping up with the times.

She had a goongang slaving in the house. "Found them starting to rip the place," she reported. "Your door doesn't hold. So I put them to work." She had indeed. Sabu was lushing it up on a bale of hay. Laura was chasing goldfish in the drawing room pool and absorbing them. The house was cleaned and immaculate. A most notable woman.

"Shape up," she ordered. The gang lined up before her timidly. "Now hear this. You two have incipient embolisms. You three are on bot, which has lethal side-effects. All of you are faggots and

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need a proctal. I want you back here tomorrow afternoon for a full medical. Hear?"

"*Yassuh, medico.*"

"R. Out."

They out. A most forceful woman. "Evening, Guig," she said in XX. "Evening all. Who's that thing? She doesn't belong to the Group. Get her out of here."

By God, Fee stood up to her. "My name is Fee-5 Grauman's Chinese. I live here and your patient is my guy. Next question?"

"She talks XX."

"And she knows about the Group. Quite a gal."

"It's the Maori strain," M'bantu interjected. A magnificent people."

Borgia grinned a mile wide, went to Fee and shook her hand like it was a pump handle. "You're my kind, Fee," she said. "There aren't enough of you around these days. We've megabred the backbone out of existence. Now let's have a look at the patient. Got somewhere more intimate, Guig? This is like a zoo, and that python keeps belching."

We walked the Chief into my study and Fee put him down in a chair at the desk. The others excused themselves to look after their pets, and Edison went to repair the door which he'd ruined. "Fill me in, Guig." I described the Chief and the disaster that had overtaken him while Borgia prowled around him and examined him. "Yes," she said. "All the basic symptoms of post-epileptic delirium: mutism, passive negativism, catatonic stupor. Easy, Fee, I'll drop the clinical jargon. Probably sounds to you like I'm depersonalizing your guy. I'm not. Now exactly what's the urgency? How much time have I?"

"We've managed to lose the U-Con brass for a little while, but they'll be howling for Guess tomorrow and a full status review. About seventy million went into the experiment and—"

"Eighty-five," Fee said, "and I can hear them howling for him now. They're in a panic and they want the Chief. Explanations or his scalp."

"They have any suspicions about what's happened to him?" Borgia asked Fee.

"Not yet. Most of them are saying he's *chickcopped.*"

"ESP?" Borgia asked me, much interested.

"No, bug-tap. So you can see everything's at stake. We have to pull him out fast or he's sunk."

"What's in it for you, as if I didn't know."

"Later, Lucy. Not in front of his girl."

"I'm not his girl," Fee said. "He's my guy."

Borgia ignored the semantics. She prowled around Sequoya again, sensing him with invisible antennae. "Interesting. Very interesting. The resemblance to Lincoln. See it, Guig? Is it a pathogenic type? I often wonder. You know,

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of course, that young Lincoln went into a cataleptic collapse after the death of Ann Rutledge. He never recovered. Remained a manic-depressive for the rest of his life. Now let's try a shortcut. Have you got any writing tools? Handwriting-type."

Fee pulled a pad and a stylus out of the desk.

"Is he right-handed, Fee?"

"Yes."

"We'll try a trick that Charcot showed me in his clinic." Borgia put the stylus in the Chief's right hand and placed the pad under it. "Sometimes they want so desperately to communicate with us, but we must find the way for them."

She bent over Guess and started to speak in Spanglish. I stopped her. "He's more comfortable with XX, Borgia."

"Oh, he's that educated? Encouraging." She spoke smoothly to the Chief. "Hello, Dr. Guess. I'm a physician. I would like to have a talk with you about JPL."

Sequoya's face didn't alter; it gazed placidly into space, but after a moment his right hand trembled and wrote:

hello

Fee let out a little yell. Borgia motioned for quiet. "Dr. Guess," she went on, "your friends are here. They are very much concerned about you. Won't you tell them something?"

The hand wrote:

doctor guess your friends are here they are very much concerned about you wont you tell them something

"So." Borgia pursed her lips. "Like that, eh? Will you try. Fee-5? Say something personal."

"Chief, this is Fee-Fie-Fo. You haven't kept your promise yet."

chief this is fee fie fo you havent kept your promise yet

Borgia tore the sheet off the pad. "Guig? Maybe something about the recent disaster?"

"Hey, Uncas, U-Con tried to sell me those naked rats. They claim they're your soul."

hey uncas ucon tried to sell me those naked rats they claim theyre your soul

Borgia shook her head. "I'd hoped this might be the road to a breakthrough but it's just echopathy."

"What's that?"

"You find it sometimes as a part of the catatonic syndrome, Guig. The patient repeats the words of another, in one form or another."

"He's just parroting?"

"That's about the size of it, but we're not licked yet. I'll show you another one of Charcot's tricks. The human psyche can be incredibly devious." She transferred the stylus to the Chief's left hand and placed the pad under it. "Hello, Dr. Guess. I'm a physician and I'd like to have a talk with you. Have you come to any con-

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clusion about what happened to your cryonauts?"

The placid face still stared into space. The left hand twitched and then began to scribble in mirror-writing, from left to right:

tub ynegolyhp
setalutipacer
ynegotno

"Mirror, Fee."

"Don't bother," Borgia said. "I read dextro and levo. He's written, 'Ontogeny recapitulates phylogeny but—' "

"But what?"

"It stops there. 'Ontogeny recapitulates phylogeny, but—' But what, Dr. Guess? What?"

Nothing.

"Failed again?"

"Certainly not, ass. We've discovered that he's functioning deep down inside. Very deep. Down there he's aware of everything that's going on around him. What we have to do is peel off the shock-layer that's formed over him."

"Do you know how?"

"Counter-shock, but if it has to be quick it's going to be iffy."

"It has to be quick. How will it be iffy?"

"They've developed a new tranquilizer, a polypeptide derivative of noradrenalin."

"I haven't understood a word."

"D'you know how tranquilizers work? They thicken the connections between the brain nuclei, the glial cells and the neurones. Slow down the transfer of nerve-firing from cell to cell and slow down the entire organism. Are you with it?"

"With."

"This noradrenalin derivative blocks it completely. It's close to a nerve gas. All traffic comes to a dead stop. That's the operative word. Dead. We may kill him."

"Why? Tranquilizers don't kill."

"Try to cope with the concept, Guig. Every nerve cell will be isolated. Alone. An island. If they link up synapses again, he'll be recovered and feeling like a fool for withdrawing. He'll be counter-shocked out of his flight from the JPL surprise. If they don't, he's dead."

"What are the chances?"

"Experimentally, so far, fifty-fifty."

"The Greek says even money is a good bet. Let's try."

"No!" Fee cried. "Please, Guig. No."

"But he's dead to this world now, Fee. You've lost him already."

"He'll recover sometime, won't he, Doctor?"

"Oh yes," Borgia said, "but it might take as long as five years without crash treatment. Your guy is in one of the deepest catatonic shocks I've ever seen, and if he has another epileptic seizure while we're waiting it out, it'll get deeper."

"But—"

"And since he's your guy I

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should warn you that if he pulls out of this on his own he'll most probably have complete amnesia for the past. That's strongly indicated in this sort of case."

"For everything?"

"Everything."

"His work?"

"Yes."

"Me?"

"You."

Fee wavered. We waited. At last she said, "R."

"Then let's shape up." Borgia was in complete control. "He should come out of counter-shock in a familiar environment. Does he live anywhere?"

"We can't get in. It's guarded by wolves."

"JPL is out of the question. Anywhere else?"

"He teaches at Union Carbide," Fee said.

"Office?"

"Yes, but he spends most of his time using their Extrocomputer."

"What's that?"

Fee looked to me for help. "Carbide built a limitless computer complex," I *esplained.* "They used to call them 'stretch computers.' Now they call them Extrocomputers. This job is stored with every datum since the beginning of time and it hasn't run out of storage space, yet."

"Gung. We'll flog him in the computer complex." She yanked a pad out of her toolbox and scribbled. "M'bantu! Here! Take this prescription to Upjohn and bring the ampule to the computer center at Union Carbide. Don't let anybody mug you. It's expensive."

"I will transport it in a cleft stick."

She smacked him lovingly. "You black bastard. Tell Upjohn to bill me."

"May I ask in what name, Borgia?"

"Damnation. Who am I now? Oh, yes. Cipolla. Dr. Renata Cipolla. Go, baby."

"Renata Onion!" I exclaimed in disbelief.

"*What are you, some kind of* antisemite? Edison! Here! Fixed that door yet? Never mind. I'll need you to rig a sterilizer for me. Also an oxygen mask. You'll come with me and bring your toolbox."

"Sterilizer?" Fee whispered. "Oxygen?"

"I may have to transect and do a coronary massage. Nemo! Nemo!" No answer. She tramped to the drawing room where he was in the pool playing with Laura. All the goldfish were gone and I wouldn't doubt that he may have eaten a few himself, just to be friendly, you understand. Borgia rapped on the perspex until he stuck his head above water. "We're leaving. Get out of that and guard the house. Door's a shambles. Shut up, Ed. Use force to repel force but don't kill anybody. Just hold them. They may need medical attention. R. Let's move it out."

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She and Edison picked up their toolboxes. As Fee and I walked Cochise out of the house I looked down into the cellar. Scented Song was sleeping peacefully on Sabu's back. I wanted to ask her to move over.

4.

No trouble getting into the center; yes, Doctor, no, Doctor, certainly, Doctor; the sleepwalker made a perfect front. There was a crowd in the center; some bright heads playing Prime against the Extro (and losing) and Spangland's popular broadcast serial, "The Rover Girls." We chased the kids but we couldn't chase the broadcast. Serious Dick, fun-loving Tom and sturdy-hearted Sam are now cadets at the Pentagon Military Academy (after their transex operations in Denmark) and are buying pot, poppers, goggies, hash and uglies as refreshments for an orgy to celebrate Serious Dick's election as Mugcurement officer of his company.

"I can't understand why this place isn't insulated like yours," Borgia complained.

"It is, but the broadcasts sneak in on the highpower lines," I explained. "Ignore them. What do I do with the Chief?"

"Flat on the floor, face up. Ed, start putting together the sterilizer and oxygen mask while we're waiting for M'bantu. Forage in the stock rooms for materials. Improvise. Go."

Of course the center was open for business, as was the entire university. In the first place, a computer is never turned off. In the second place, everything these days is turned on on a twenty-four-hour basis. How else can you get some work out of a jillion deserving welfare cases unless you operate twelve two-hour shifts?

You all know what a computer complex looks like; the hardware standing like a reunion of grandfather clocks, the satellite computers standing around them. The only difference with the Extro is that the satellites need satellites to feed them. You have to go through channels to get to the boss and he's rather abrupt. His business is to take a small question which nobody can answer, move it around through his infinity of bits, and then come out with a curt answer.

The Rover Girls were in a jam. Their father has been missing for a year. Ms. Stanhope, widowed mother of Serious Dick's sweetheart, Bruce, is being sopored off her feet by the wicked Josiah Crabtree, teacher at the Pentagon. Crabtree is really after Ms. Stanhope's fabulously rich acid farm. He also favors a Pentagon cadet, the bully, Dan Baxter, who hates the Rover Girls. Crabtree and Baxter were Honks, naturally.

Edison and M'bantu (*senza* cleft stick) pulled in at the same time. Ed had two heads pushing a skid

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loaded with gear; oxygen tank, sterilizer, plumbing and accessories. Don't bother to ask how he dragooned the bods into helping him or how he liberated the necessaries; the entire Group has the overpowering habit. It's not deliberate, we just scare the Shorties. The mere fact of youth is beauty; the mere fact of longevity is authority.

"R." Borgia in control. "Out the heads. Set up, Ed." She opened her toolbox which didn't look much different from Edison's. "Ampule, McBee. We'll shape up and move it. Fee-5, answer a few questions and then out. His height?"

"Six."

"Weight?"

"One-eighty."

"Age?"

"Twenty-four."

"Condition?"

I broke in. "I've seen him in the saddle. Hard and fast."

"Gung." Borgia did some delicate loading of a syringe from M'bantu's ampule. "Ready, Ed?"

"Ready."

"Out, Fee."

"I will not out."

"Out."

"One good reason why."

It was a meeting of the giants. Borgia softened. "This will be horrible to watch, kitten, especially since he's your guy."

"I'm not a child any more."

Borgia shrugged. "You're going to be even less of a child after this is over." She stepped to the Chief and gave him a slow, careful intravenous. "Clock it, Guig."

"Starting when?"

"I'll tell you when."

We waited, not knowing what to expect. Suddenly a ghastly scream was pulled out of the Chief.

"Now, Guig."

The scream became accompanied by agonized thrashings. Every vent in Sequoya let go; bowels, urine, semen, saliva, sinuses, sweat glands. Fee was alongside me, clinging and gasping. I was breathing heavily myself.

"Synapses breaking connections," Borgia said in a professional monotone. "He'll need a bath and clean clothes. Time?"

"Ten seconds."

"If he lives, that is." Abruptly, the Chief was still. "Time, Guig?"

"Twenty."

Borgia got a stethoscope from her bag and examined the Chief. "Time?"

"One minute."

She nodded. "So far so good. He's dead."

"Dead!" Fee cried. "He's dead?"

"R. Everything's come to a dead stop. Shut up. I told you to out. We have four minutes before any permanent damage sets in."

"You have to do something. You—"

"I told you to shut up. His nervous system will make it on its own, or else it won't. Time?"

"One thirty."

"Ed, promote another coverall

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and soap and water. He stinks. McBee, hold the door. Nobody in. Move it." She examined the Chief again. "Nicely dead. Time?"

"One forty-five."

"Can you move the frame, Fee?"

"Y-Yes."

"Give me the sterilizer temperature reading. Dial on the right."

"Three hundred."

"Turn it off. Switch on the left. Time?"

"Two ten."

Another examination. Edison came hurtling in with a coverall, followed by his faithful slaves lugging a sitz bath of steaming water.

"Strip him and clean him. Don't move him any more than necessary. Time?"

"Two thirty."

"If he doesn't make it at least we'll have a fresh, well-dressed corpse."

Borgia's cool wasn't fooling me; she was as tight as the rest of us. After we cleaned the Chief we started to dress him but she stopped us. "I may have to go in. You bods, thanks. Get all the filth out of here. Fee, alcohol in my kit. Jet his chest down to the navel. Move it. Time?"

"Three fifteen."

"Mask ready, Ed?"

"Ready."

"It's going to be close." After an hour she asked, "Time?"

"Three thirty."

The door irised open and Jacy pushed past McBee, who didn't dare try to stop him. "Guig! What are you doing to that poor man? For shame!"

"Will you get the hell out of here, Jace. How'd you know, anyway?"

"It's all over the university that you're torturing a man in here. It must stop."

"Go back to bed, Jacy," Borgia said. "Your stigmata's showing. Jet my hands, Fee, up to the elbows. Then back off. All of you back. Save the sermonizing, Jacy. We may need it later." She glared down at Sequoya. "Come on, you sons of bitches, link up!" She gazed around in a fury. "Where the hell are the Rover Girls? I wanted everything to be familiar. Just when you need them— Time?"

"Three fifty."

We waited. We waited. We waited. Fee-5 began a quiet howl. Borgia gave me a black look of despair, went to the sterilizer and took out tools. She knelt alongside Sequoya and poised a scalpel for primary incision. His chest suddenly rose to meet the point. It was the deepest most beautiful breath I have ever seen taken in all my life. We began to bubble.

"Quiet," Borgia ordered. "Give him time. No fuss. Back off. Everything familiar when he wakes up. He'll be weak, so no unnecessary strain."

The steady breathing was accompanied by tics, muscular con-

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tractions, twitches. "Linking up fine," Borgia murmured to no one.

The Chief's eyes fluttered open and took in the scene. "—but cryology recycles ontogeny," he said. He tried to get to his feet. Borgia motioned to Fee who ran to him and helped him, steadying him when he rocked. He looked at himself, looked around, took us all in. Then he smiled. It must have been his first realsie and very painful, but it was a nice smile. Fee began to weep. "The old familiar faces," he said. He came to me and slapped palms. "Thanks, Dude. You're ace. Fee, you're my girl more than ever. Lucy Borgia, down tools." She dropped them and he palmed her. "Edison. M'bantu. Gung to the fifth power. Jacy, you heard the lady, go back to bed. Where's that tutta? Oh. The Rover Girls sign off every two hours to make room for the next shift, Borgia. We'd better get out of here before they're back."

I stared at her. She smiled. "Told you he was aware of everything around him."

"Guig, the greatest thing you ever did was putting a hold on the cryocapsule. Fee, chop to JPL and call a stockholders' meeting for one hour from now."

I gave Borgia another questioning look.

"Everything."

"This is going to be tremendous," the Chief said. "Those naked rats have opened up a Pandora's box that—I have to eat something. Where?"

"My place," I said, "but don't walk into the oven, the door doesn't work."

Edison started to protest vehemently. Sequoya soothed him. "Never mind, Ed. I was impressed by your smoke screen at JPL. You're brilliant. The whole Group is."

"He knows too much," I muttered to Borgia, "and I'm scared."

"How many times must I ditt? He was aware of everything going on around him."

"Y, but I think he's aware of things that didn't go on around him. I think I've got a tiger by the tail."

"Then let go."

"I can't now. I only hope we don't return from the ride with me inside and the smile on the face of the tiger."

The Rover Girls came on again and we got the hell out while rotten Dan Baxter was selling the secret signals to Annapolis. We marched Jacy back into bed and then walked to my place where Scented Song and M'bantu faked a sort of Afro-Chinese dinner. It wasn't bad and it reminded the Sachem of his wolves. He said he hoped some goon would try to rip his tepee so they could get a decent supper. While we were cross-legged on the dining room floor, Fee-5 came tearing in.

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"All set for four o'clock, Chief. What are you going to tell them?"

"I don't know yet," he grunted. "It's too damn big to simplify, and the U-Con heads aren't very bright."

"Exactly what is the problem, Doctor?" McBee asked.

"Shifting gears, M'bantu. I had to make a lightning shift when I looked into the capsule and I feel like a damned fool for going into shock. Bless you all for saving me. My God, it was like a paleface ambush . . ."

"When you saw the naked rats?" I asked.

"They aren't rats."

"Aliens from outer space, maybe, taking over our world?"

"Don't Rover-Girl me, Guig. You'll find out in due time. I have to sort it out in my head first. I wish you could transplant an extra brain into my skull, Nemo."

"You don't need it, lad."

"Thanks. Now let me think for a minute."

So we all ate in silence and waited. Even Fee was quiet. That was quite a quantum jump.

"Here are the problems," Sequoya began at last. "Explain to United Conglomerate what actually happened, and the overwhelming concept it opened up. I must give them some idea of the procedures involved in exploring the discovery. I must make them understand that the Pluto mission will have to be scrubbed."

"Scrubbed! After all that advance publicity?"

"That's what's going to hurt, Guig, but the results of the cryo exploratory have wiped out the Pluto mission for our time, maybe for all time. But on the other hand it's produced something so unexpected and challenging that I've got to persuade them to transfer the Pluto funding into it. I can handle the scientific palaver but I'm dumb as a Honk when it comes to selling a proposition."

"We'll need the Greek Syndicate for advice on that," I whispered to the princess. She nodded and slipped out.

"The only reason I'm being so open with you is that I've learned to trust and respect your Group."

"How much do you know about the Group, Sachem?"

"A little."

"Fee told you?"

"I never said a word!" she protested.

"You've been reading my diary. Yes?"

"Yes."

"How the devil did you learn how to decode my private terminal keyboard?"

"I taught myself."

I threw up my hands. Go live with a clever girl. "How much did you pass on to your guy?"

"Nothing," Sequoya said with his mouth full. "What little I know is from induction, deduction, hints, clues, things overheard. I'm a scien-

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tist, you know, and I'll tell you something else, I not only speak XX, I read Body English. So why don't we drop it? I've got a murderous scene ahead of me and I depend on your Group to help me. Wilco?"

"Why should we?"

"I could blow the whistle on your act."

"F."

"Good for you." He smiled again and it was very winning. "Because we all like each other and want to help each other."

"You Indian con. Wilco."

"Gung. I'll need you and Edison. Fee too, of course. I'll brief you in the chopper so you can ask the right leading questions at the status review. Let's chop."

When we arrived at JPL I was so dazed by the enormity of Sequoya's discovery and the frontiers it had opened that I wasn't aware of anything around me. All I know is that I recovered consciousness in a large laboratory seated on a retrobench along with some fifty United Conglomerate majority stockholders. We were facing Hiawatha who stood with his back to a work table cluttered with chemical apparatus. He was leaning against it and looked relaxed and pleased, as though he was about to hand the U-Con brass a surprise package. He sure was. The question was, would they buy it? The entire review was conducted in Spang, of course, but I translate for my goddam diary and Fee-fink Grauman's Chinese.

"Ladies and gentlemen, good morning. You've been waiting anxiously for a status review so I won't apologize for calling you together at four in the morning on such short notice. You all know me; I'm Dr. Guess, project scientist on the Pluto mission, and I have remarkable news for you. Some are expecting this to turn into a failure review but—"

"Never mind the spook talk," I yelled. It had been agreed that I was to be the bad guy. "Just tell us why you failed and lost us ninety million." Some of the stockholders glared at me, which was the purpose of my nasty behavior, to attract hostility from Guess to myself.

"A fair question, sir, but we have not failed; we have had a tremendous unexpected success."

"By killing three cryonauts?"

"We did not kill them."

"By losing them?"

"They are not lost."

"No? I didn't see them. Nobody saw them."

"You did see them, sir, in the cryocoffins."

"I saw nothing but things that looked like naked rats."

"They are the cryonauts."

I laughed sardonically. The stockholders rustled with interest and there were growls directed to me, "Gag, man. Let him do the talking."

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I subsided and Edison took over. "Dr. Guess, this is an amazing statement, unheard of in the history of science. Will you explain yourself, please?" Ed was the good guy.

"Ah! My old friend from the RCA plasma division. This will be of particular interest to you, Professor Crookes, because the electronic discharges which we call plasma may very well be involved." Guess turned to the assembled. "Professor Crookes is not an intruder. He is one of several experts I invited to witness the put-down."

"Stop stalling and start the alibi," I called.

"Certainly, sir. Some of you may recall an historic theory developed in embryology centuries ago; ontogeny recapitulates phylogeny. In other words, the development of the embryo within the womb duplicates the successive lost stages in the evolution of the species. I do hope you remember this classic."

"If they don't, Dr. Guess, you're making it abundantly clear," Edison said pleasantly.

I thought it time for another sneer. "And what are you paying your old friend for his loyal support? How big a cut of a hundred million is he getting?"

A lot more growls at me. I gave thanks that Fee-5 had been in on the briefing or she would have been at me with claws. Sequoya ignored the rude man in the third row. "Ontogeny recapitulates phylogeny, but—" Here he paused. "But I believe we have discovered that cryology recycles ontogeny."

"Good God!" Edison exclaimed. "This will make history for JPL. Are you sure, Dr. Guess?"

"As sure as any experimenter can ever be, Professor. Those quote naked rats unquote are embryos, the embryos of the cryonauts. After ninety days in space they have been regressed to an early stage in fetal development."

"Any theory why?" This from a bright stockholder.

"I must be honest; none. We never had a hint of this fantastic possibility in any of our cryogenic preparations, but all the experiments were conducted on Earth where they were protected by our heavy atmospheric insulation. We did orbit animal subjects but only for short periods. Our three cryonauts were the first to be exposed to space for an extended period and I have no idea of what factors produced the phenomenon."

"Plasma?" Edison asked.

"Indeed, yes. Protons and electrons in the Van Allen belts, the solar wind, neutrons, quasar radio bursts, hydrogen ion emissions, the entire electromagnetic spectrum . . . there are hundreds of possibilities. All must be explored."

Edison, enthusiastic, "I would be honored to be permitted to assist you in this tremendous project, Dr. Guess." Then he added in XX. "And I mean it."

"I would be honored to have

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your help, Professor Crookes."

A Ms. stockholder asked in watery tones, "But what about the poor, dear cryonauts? And their families? And—"

"That's the most pressing problem. Is it merely a reversal of ontogeny or is it a full recycling? Will they regress to the ovum stage and die? Have they already reached that stage and are developing again to maturity? What will they develop into: infants, grown men? How do we explore this? How do we continue the process?"

General confusion. It was the cue for my next question, not too hostile this time. "I grant that you may be telling the truth, Guess."

"Thank you, sir."

"And I grant that this may be an astonishing discovery, but are you asking United Conglomerate to finance you in what appears to be pure research?"

"Well, sir, in view of the fact that the Pluto mission must be postponed . . ."

Anguished cries from the deserving dividenders.

"Ladies and gentlemen, please! The Pluto mission was based on the belief that we could send cryonauts through space. We have discovered that we can't, yet. Everything must be postponed until we learn exactly what happens to a cryonaut. Naturally I would expect United Conglomerate to transfer the JPL funding to this pure but essential research. It will be the only way of protecting your investment."

More cries from the stockholders. A powerful voice from the back of the laboratory cut through the confusion. "If not, *we* will finance it."

Guess was genuinely startled. "Who are you, sir?"

The Greek Syndicate stood up: squatty, thick hair, thin mustache, elegant with an eyeglass. "I am Poulos Poulos, investment director of the independent, sovereign state of I. G. Farben Gesellschaft. My word is my honor and I give you my word that I. G. Farben will support your research to the limit. So far we have never reached our limit."

Sequoya looked at me.

"Group," I called in XX.

The Chief smiled. "Thank you, Mr. Poulos. I will be happy to accept your offer if—"

Angry shouts. "No! No! No! It's ours. We paid so far. You have a contract. Iron-bound. Results of research are ours. We haven't said no yet. We have to know more. Then we'll decide. Can't stampede us. Twelve hours. Twenty-four. We don't know where we are yet."

"You *should* know," the Syndicate said contemptuously. "*We* know where we are. You people prove the truth of an ancient maxim: Never show a fool or a child a thing half-finished. We at I. G. Farben are neither foolish nor childish. Come to us, Dr. Guess. If these fools attempt legal action,

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we'll know how to handle it."

Fee-5, who had been standing quietly behind the workbench with a careful ear cocked, said, "The stockholders are confused because you haven't told them what results you expect from the research, Dr. Guess. That's what they want to know."

"But I can't tell them. This is an Emergent program."

"Ah!" Edison was genuinely with it. "Very true. You had better explain, Dr. Guess. Permit me." He stood up. "Ladies and gentlemen, please listen to your project scientist. He will answer your crucial question." They shut up. Authority.

"A basic concept in research," the Chief said carefully, "is the question of whether the constituents of the experiments will yield Resultant or Emergent finds. In essence this is like bringing two people together. Will they become friends, lovers, enemies? How do you predict it? You all know that it can't be predicted."

The Ms. stockholder sobbed.

"In a Resultant experiment the outcome can be foretold from the very nature of the constituents. There is no new and unforeseen set of properties arising from the combination of the constituents."

Edison (Professor Crookes) was nodding and beaming. I had to work hard to follow the exposition and I doubted whether the U-Con heads were twigging at all, but they seemed to be impressed.

"The nature of an Emergent cannot be foretold from the nature of its several constituents as they were prior to combination. The nature of an Emergent can only be discovered through experiment and observation, and no one can possibly foretell it. It springs up, new and unexpected, to the surprise of everybody."

"Example," Edison called in XX.

"Here is an example. We know the constituents of the human animal. From these constituents is it possible to predict the phenomenon of abstract thought? Is abstraction Resultant or Emergent?"

"Knock," I called in XX. "A simple, graphic example which even heads can see and believe."

Sitting Bull thought hard for a moment. Then he turned to Fee. "Nitric acid. Hydrochloric. Three beakers. Three slugs of gold."

While she scurried to the stock shelves he smiled at the house and said, "I'm going to give you a simple demonstration. I will show you that neither nitric acid nor hydrochloric acid attack the noble metals. Their properties are known. And yet when they are combined they form an Emergent called *Aqua Regia* which does consume the noble metals. Early chemists had no way of predicting this. Today, with our knowledge of ion transfer, we do understand and can predict, particularly when we're assisted by computer analysis. This is what I mean when I say the new cryogenic

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research is Emergent. Nothing can be foretold. Computers can't help us because a computer is no better than its data and we have no data yet. Thank you, Fee."

He set up the three beakers, dropped a chunk of gold into each and unstoppered the acid bottles. "Watch closely, please. Gold in each beaker. Hydrochloric acid in the first. Nitric acid in the second. Aqua Regia, the royal water, in the—"

He was interrupted by a blast of coughings, gaspings, stranglings. It sounded like fifty people were drowning. In half a minute the entire audience had stampeded out of the laboratory; only Edison, the Syndicate and myself were left with the Chief. Sequoya looked at us in bewilderment. "What happened?" he asked in XX.

Glassware began to crash down as their metal supports gave way. Window blinds and valence and spectra charts fell with a clatter. The light fixtures dropped with sizzling short circuit flares, and we were in pitch darkness. "What happened?" Guess repeated.

"What happened? I can tell you what happened." Edison barked with laughter. "That damn fool girl brought you fuming nitric acid. Fuming. And the fumes have turned this room into one big nitric acid bath. Everything's being eaten away."

"Did you see her do it? Did you see the label? Why didn't you stop her?" The Chief sounded furious.

"No. No, and no. I've deduced it. Not an Emergent, just a Resultant."

"Dear God! Dear God! I've ruined the whole pitch to the U-Con crowd." Despairing.

Suddenly I did the take and let out a yell.

"What's the matter, Guig?" the Group called. "Are you hurt?"

"No, you damn fools, and that's why I'm hollering. I'm Grand Guignol triumphant. Don't you understand? Why didn't he know it was fuming nitric acid? Why didn't he choke on the fumes? Why isn't

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he eaten away now? Why wasn't he forced to run out with Fee and the rest? Think about it while I revel."

After a long moment, the Syndicate said, "I never believed in you, Guig. I apologize. It was a billion to one against, so I hope you'll pardon me."

"You're pardoned. You're all pardoned. We've got another Molecular Man. We've got a brand new beautiful Moleman. Still there, Uncas?"

"I can't understand a word you're saying."

"Take a deep breath of nitric. Belt down a stiff shot. Do anything you like to celebrate because nothing, but nothing you eat, drink or breathe can kill you. Welcome to the Group."

5.

And he disappeared. How it happened: we had to get out of the acid bath before everything was eaten off us: rings, watches, bridgework, fillings, the portable lab Hiawatha carried inside his tutta. There was a crowd of dumfounded stockholders milling outside the laboratory sounding like victims of a coryza plague, and we got separated. When we finally got together again, clustered around Fee-5, the Chief was gone and there was no locating him in the crowd. We hollered for him in XX. N. Fee began to panic.

I gave her a look. Again no time for cosseting. "Where can we talk in private? Sacred private?"

She feathered her vanes and landed again. "The high vacuum chamber."

"R. Go."

She led us on a twisted course to a giant sphere, opened a sequence of submarine hatches and we were inside the sphere keeping company with half a space capsule.

"High vacuum circuitry check," she said.

"Lovely scene for criminal assault."

She gave me a look, the equal of mine, and it began to dawn on me that I'd better mind my manners with this new-risen phoenix.

I said to the Syndicate, "That was a lovely performance. Thanks."

"Ah yes. To make someone want something you must show them that someone else wants it more. Elementary."

"By any chance was anything you said true?"

"But it was all truth."

"You represent the independent sovereign state of I. G. Farben?"

"I own fifty-one percent of it."

"How much of the whole world do you own, Greek?"

"Fourteen point nine one seven percent, but who counts."

"My God, you're rich. Am I rich?"

"You have 11,600,103. By my standards you are poor."

Fee-5 let out a little moan and I relented. "R," I said. "It's a simple problem. The poor bastard has had

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too many shocks in one day and he's run off in all directions. All we have to do is find him and cool him. Now, he may be somewhere in the JPL complex or at the university. Your job, Fee. Find him."

"I can if he's anywhere."

"R. Let's hope he's somewhere. Now he may have scuttled for the tepee, but there's the problem of the wolves. We'd better let M'bantu handle that. On the other hand he may have levanted to a Particle Bio research center for technical advice. Ed?"

"I'll handle that."

"He may have cut for a patent office to file for an exclusive on his discovery."

"Mine," the Syndicate said.

"He may have started on a bash to relieve the pain. I'll put Scented Song on that."

Edison barked his laugh. "I can just see her charging into the hellholes on Sabu."

"Y. I'd like to be with her. Now there's an outside chance that he may have gone into cataleptics again. That's for Borgia."

"What about you, Guig?"

"I'm going back to my place. Nemo and I will hold the fort. Keep the progress reports coming. Gung?"

"R."

Fee had been breathing heavily—controlling panic, I thought—but now she began to gasp in heaves and her face was turning blue.

"Now what?" I shot at her.

"Not her fault," Ed said calmly. "Somebody's started pumping out the chamber. She's strangling on vacuum."

"Never a dull moment at JPL," I said. "Out." We out, me carrying Fee-Cyanosis Chinese, and a dozen techs outside wanted to know how dast we be in there contaminating the circuits. You can't please everybody.

So we dis- on our various searches for Sequoya- persed and I did like hell go home. I had a damned good hunch where the Chief had taken refuge (I hadn't spent five days in a bamboo caul for nothing) and I took the next linear for the Erie reservation. But I did have the courtesy to call and brief Nemo on the assignments.

Now here had been this mudhole, the size of a Moon crater, 240 miles long, 60 miles wide, 200 feet deep, black, repellent, all ooze, crisscrossed with gutters containing the poisonous effluents extruded by a better industry for a better tomorrow. This was the generous gift to the Amerind nations to possess and inhabit forever or until a progressive Congress changed its mind again. Nine thousand square miles of hell.

Now it was nine thousand square miles of paradise. It reminded me of the magnificent back shell of a box turtle I'd seen once: odd-shaped fields of poppies glowing red, orange, yellow, green, indigo, blue, violet. The channels had been

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roofed over with tile. The lake bed was scattered with wickiups, the traditional Indian huts, once made of mud and branches, but these were built of marble, granite, limestone, terracotta, travertine. Flagged roads wandered everywhere in no particular pattern, and all around the lake bed was a gentle cushion fence that pushed you back if you came too close. If you persisted in coming closer it stiff-armed you with a piston-jolt.

The gate was guarded by Apaches, all no-nonsense courtesy and speaking nothing but Apache. I couldn't palaver with them; I just kept repeating, "Sequoya," in a determined voice. They hocked a tsheinik for a few minutes and then the boss of the gate issued me a guide in a hovercraft. He drove me through a tangle of roads and paths to a most impressive wickiup and pointed. There was the Chief in a breechclout with his back to a marble wall, enjoying the morning sun.

I sat down alongside him without a word. Every instinct told me to adapt myself to his tempo. He was silent, deadpan, immobile. Me too. It was a little buggy.

After a few hours of silence he lazed to his feet. I didn't move until he reached down a hand to help me up. I followed him into the wickiup. It was as beautifully decorated as his tepee and enormous: room after room in tile and leather, Hopi scatter rugs, spectacular silver and porcelain. Seguoya hadn't been lofting me; these redskins were rich.

He called something in what I figured was Cherokee and the family appeared from all directions. Papa, most majestic and cordial and even more of the Lincoln type. (I suspect that Honest Abe may have had a touch of the redbrush in him.) Mama, so billowy that you wanted to bury yourself in her when you were in trouble. A sister around seventeen or eighteen, so shy I couldn't get a look at her, she kept her head lowered. A couple of kid brothers who immediately charged on me to touch and feel my skin with giggles. Evidently they'd never seen a paleface before.

I minded my manners; deep bow to papa, kiss mama's hand, kiss sister's hand (whereupon she ran out of the room), knocked the boys' heads together and gave them all the trinkets and curios I had in my pockets. All this, you understand, without a spoken word, but I could see the Chief was pleased and he sounded pleasant when apparently he explained me to the family.

They gave us lunch. The Cherokees were originally a Carolina crowd so it was sort of coastal: mussel soup, shrimp and okra, baked hominy, berry corn cobbler and yalipan tea. And not served on plastic; bone china, if you please, and silver flatware. When I offered

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to help with the dishes, mama laughed and hustled me out of the kitchen while sister blushed into her boozalum. Sequoya chased the kid brothers who were climbing all over me and led me out of the wickiup. I thought it was going to be another lie-down in the sun but he began to saunter down the paths and roads, walking as though he owned the reservation. There was a light breeze and the entire spectrum of poppies genuflected.

At last he asked, "Logic, Guig?"

"No."

"Then how?"

"Oh, we had a dozen rational possibilities, the Group is tracking them down, but I related."

"Ah. Home."

I grunted.

"How long since you've had a family and a home, Guig?"

"A couple of centuries, more or less."

"You poor orphan."

"That's why the Group tries to stick together. We're all the family we have."

"And now it's going to happen to me."

I grunted.

"It is, isn't it? You weren't shooting me through a Black Hole?"

"You know it is. You know it's happened already."

"It's like a slow death, Guig."

"It's a long life."

"I'm not so sure you did me a favor."

"I'm positive I had nothing to do with it. It was a lucky accident."

"Lucky!"

We both grunted.

After a few minutes he asked, "What did you mean, 'Tries to stick together'?"

"In some ways we're a typical family. There are likes and dislikes, jealousies, hatreds, downright feuds. Lucy Borgia and Len da Vinci have been at each other's throats since long before I was transformed. We don't dare even mention them to each other."

"But they gathered around to help you."

"Only my friends. If I'd asked the Rajah to come and lend a hand he wouldn't even bother to turn me down; he hates me. If Queenie had come it would have been a disaster; Edison and Queenie can't abide each other. And so it goes. It's not all sweetness and light in the Group. You'll find out as you get to know all of us."

We broke off the talk and continued the walk. Each time we passed one of those luxury wickiups I saw handicrafts in progress: looms, pottery wheels, silversmiths, ironmongers, leatherworkers, woodcarvers, painters, even a guy flaking arrowheads.

"Souvenirs for the Honk tourists," Sequoya explained. "We convince them that we still use bows and arrows and lances."

"Hell, man, you don't need the money."

"No, no, no. Just goodwill. We

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never charge the tourists anything for souvenirs. We don't even charge an admission fee at the gates."

God knows, Erie seemed to be up to its ass in goodwill. It was all silence and smiles. *Dio*! The blessed quiet! Apparently the cushion fence blocked broadcasts as well as unwelcome visitors.

"When they squeezed the nations and tribes out of our last reservations," Sequoya said, "they generously gave us the bed of Lake Erie for our very own. All the fresh water feeding the lake had been impounded by industry. It was just a poisoned bed, a factory sewer, and they moved us all in."

"Why not the charming, hospitable south pole?"

"There's coal down there that they're hoping to get at some day. The very first job I had was working on techniques for melting the ice cap."

"Most farsighted."

"We dug channels to drain the pollution. We put up tents. We tried to live with the rot and the stench. We died by the thousands; we starved, suffocated, killed ourselves. So many great tribes wiped out."

"Then what turned this into a paradise?"

"A very great Indian made a discovery. Nothing would grow in the poisoned land except Ugly Poppies."

"Who made the discovery?"

"Isaac Indus Guess."

"Ah. I'm beginning to understand. Your father?"

"My great-grandfather."

"I see. Genius runs in the family. But why do you call them Ugly Poppies, Chief? They're beautiful."

"So they are, but they produce a poisoned opium, and ugly drugs are extracted from it: new drugs, unheard of drugs with fantastic effects—they're still exploring the possible derivatives—and overnight, in a drug culture, the reservation became rich."

"That story's a fairy tale."

He was surprised. "Why do you say that, Guig?"

"Because a benevolent government would have taken Erie away from you for your own good."

He laughed. "You're absolutely right, except for one thing: there's a secret process involved in getting the poppies to produce the poisoned opium, and they don't know it. We're the only ones who do and we're not telling. That's how we won the final war with the palefaces. We gave them the choice: Erie or poppy poison, not both. They offered all sorts of treaties, promises, deals, and we turned them down. We've learned the hard way not to trust anybody."

"The story's still thin, Chief. Bribes? Blackmail? Treason? Spies?"

"Oh yes, they've tried them all. They still are. We handle them."

"How?"

"Oh come now, Guig."

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He said that with such casual amusement that a chill ran down my spine. "Then what you've got, in effect, is a Redskin Mafia."

"More or less. The Mafia International wanted us to join them but we turned them down. We trust no one. They tried to use muscle but our Comanches are still a tough tribe . . . too tough, I think. But I was grateful for that little war. It cooled the Comanche feist and they're easier to live with now. So's the Mafia International. They won't start pressuring again. We gave them a bellyful of traditional barbarism they'll never forget. That's our college."

He pointed to about forty acres of low, white clapboard buildings. "We built it in the Colonial style to show there were no hard feelings for the early settlers who started the great robbery. Firewater distillery. Ugly synthesis. Education. It's the best college in the world and we've got a waiting list a mile long."

"Students?"

"No. Professors. Research fellows. Teachers. We don't admit students from the outside; it's reserved for our own kids."

"Are any of your kids on junk?"

He shook his head. "Not that I know of. We don't run a permissive society. No drugs. No bugs."

"Firewater?"

"Now and then, but it's so *horroroso* that they quit pretty soon."

"Is it a secret process, too?"

"Oh no. It's alcohol, strychnine, tobacco, soap, red pepper and brown coloring."

I shuddered.

"Anyone can have the recipe because we've got a lock on the brand name. The Honks want Erie Firewater and no substitutes."

"And they can have it."

He smiled. "Hiram Walker gave us a hard fight with Canadian Firewater—they must have put a hundred million into the promotion—but they lost out because their advertising made a stupid mistake. They didn't realize that the Honks don't know there are any Indians in Canada: they think all the Canadian originals are Eskimos, and who wants to drink Eskimo icewater?"

"Do you trust me, Chief?"

"Yes," he said.

"What's the Ugly Poppy secret?"

"Oil of Wormwood."

"You mean the stuff that drove absinth-drinkers mad back in the Nineteenth Century?"

He nodded. "Distilled from the leaves of *Artemisia absinthium*, but it's a highly sophisticated process. Takes years to develop expertise if you're thinking of learning it. We'll make an exception and admit you to our college."

"No thanks. Genius doesn't run in my family."

Meanwhile he led me to an enormous marble pool, the size of a small lake, filled with crystal wa-

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ter. "We build them for our kids," the Chief said. "They've got to learn to swim and handle a canoe. Tradition." We sat down on a bench. "R," he said. "I've told you everything. Now you tell me. What have I got myself into?"

This was no time for hard-sell. I spoke matter-of-factly. "This has to be secret, Sequoya. The Group has always kept it a secret. I don't ask for your word of honor, pledges, any of that S. You know we trust each other."

He nodded.

"We've discovered that death is not an inevitable metabolic process. We seem to be immortals but we have no way of knowing whether or not it's permanent. Some of us have been around for ages. Will it last forever? We don't know."

"Entropy," he murmured.

"Yes, there's always that. Sooner or later the entire universe must run down, including us."

"What transformed the Group, Guig?"

I described our experiences.

"All psychogenic," he said. "And that's what happened to me. Y? But Guig, you're saying that I'll remain twenty-four forever."

"R. We all hold at the age of our transformation."

"Aren't you ignoring the natural deterioration, the breakdown and aging of organs?"

"That's one of the mysteries. Young organisms are capable of repair and regeneration. Why is this power lost with age? It isn't with us."

"Then what promotes regeneration in the Group?"

"We don't know. You're the first research scientist to join the Group. I'm hoping you may find out. Tycho has a theory, but he's an astronomer."

"I'd like to hear it anyway."

"It's kind of involved."

"Never mind. Go ahead."

"Well . . . Tycho says there may be lethal accretions that accumulate in body cells, the side-products of normal cellular reactions. The cells can't absorb or eliminate them. They build up over the years, eventually choking the cell's normal function. So the body ages and dies."

"So far he's on solid ground."

"Tycho says the nerve-firing of the death-shock may destroy these lethal accretions so the body can make a fresh start, and it accelerates cell renewal to such a high rate that the body is constantly making fresh starts. It's a psychogenic effect produced by a psychogalvanic effect."

"Did you say astronomer? He sounds more like a physiologist."

"Half and half. He's an exobiologist. Whether he's right or wrong there's no doubt that the phenomenon is part of the Moleman syndrome."

"I was waiting for you to get to that. Exactly what is a Molecular Man?"

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"An organism that can transform any molecule into an anabolic build-up."

"Consciously?"

"No. It just happens. The Moleman can breathe any gas, absorb oxygen from water, eat poison, be exposed to any environment, and all are transformed into a metabolic asset."

"What happens when there's physical damage?"

"If it's minor, it regenerates. If it's major, kaput. Chop off a head, burn out a heart, and you've got one dead immortal. We're not invulnerable. So don't go running around like Superman."

"Who?"

"Forget it. I've got a more crucial warning about our vulnerabilty. We don't dare take chances."

"What sort of chances?"

"Our immortality is based on the constant, accelerated cell renewal. Can you mention a classic case of accelerated cell growth?"

"Cancer. You mean the Group—we—?"

"Yes. We're only a hair's-breadth below the insane, uncontrolled growth of cancer."

"But we've cured cancer with Folic Acid Phage. It has an antibiotic effect on the wildcat nucleic acids."

"Alas, we're cancer-prone, but we don't get it. Carcinogens merely open the door for something worse, a leprosy mutation we call Lepcer."

"*Dio!*"

"As you say. Lepcer is a bitch's bastard gene distortion in *Bacillus leprae*. It produces variations and combinations of nodular leprosy and anesthetic leprosy. It's unique to the Group. There's no known cure, and it takes half a century to kill in agony."

"What has this to do with taking chances?"

"We know that carcinogens are the result of the irritations and shocks of the outer environment. They must be avoided. You never know what injury will kick you up above the cancer threshold and open the door for Lepcer. You'll have to learn caution, and if you're forced to take a chance at least know the price you may have to pay. That's why we don't go looking for kinky things to eat, drink and breathe."

"Is Lepcer the inevitable result of injury?"

"No, but don't get rash."

"How would I know if I got hit?"

"Primary symptoms; red areas on the skin that pigment, hyperesthetic exaltation, bad throat and larynx."

"Suddenly I've got them all," he smiled. I was glad he could joke about the ominous warning.

"You've had a rough time, Chief," I said, "but don't you think you'd better get back to work? There's so much to be done. I'd just as soon loaf around Erie for a year, enjoying the reservation, but we really ought to get back to the

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madhouse. How do you feel about it?"

He got to his feet. "Oh, I agree. R. After all this what else could possibly happen?"

As we sauntered back to the wickiup I was agreeing with Sequoya. After the past two days there couldn't be any more surprises, which just shows how smart I can be. When we got back to the marble job I called Captain Nemo and told him to pull the Group off the search. Our Wandering Boy was returning to the fold. I had to remind Uncas to get dressed, not that half the pop. didn't walk around naked, but after all he was a distinguished scientist and had certain appearances to keep up. Conspicuous Consumption. The Chief called it Chicken Consumption.

The family assembled and jabbered in Cherokee which, frankly, is not an attractive language; it sounds halfway between the two worst in the world, Gaelic and Hebrew, all gutturals and *szik-ik-scha* noises. After the Chief finished his explanations I made my manners again. No *szik-ik-scha*. Profound bow to papa. Kiss mama's hand. And then, at this moment, God (who has one of His command posts in Jacy) trapped me into the most magnificent mistake of my life.

When it came sister's turn for the amenities I put two fingers under her chin and tilted her face up for a look. It was an oval face on an oval head set on a neck long enough for a guillotine. She was no beauty; she wasn't even pretty; she was handsome, handsome. Exquisite bones, deep eyes, limpid skin, all character. I looked into that face and saw an entire world I never dreamed existed. And then came the mistake. I kissed her good-bye.

Everyone froze. Dead silence. Sister examined me for about as long as it would take to recite a sonnet. Then she knelt down before me and swept her palms back and forth over my feet. All hell broke loose. Mama burst into tears and swept sister into her billows. The urchins began yelling and cheering. Majestic papa came to me, put a palm on my heart and then took my palm and put it on his heart. I looked at the Chief, completely bewildered.

"You've just married my sister," he said casually.

I went spastic.

He smiled. "Tradition. A kiss is a proposal of marriage. She accepted and about a hundred Erie braves are going to hate you for it. Don't panic, Guig. I'll get you out of it."

I disengaged sister from the billows and kissed her hello this time. She started to kneel again but I held her upright so I could plunge into that brand new world. "N," I said.

"You don't want out?"

"N."

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"You mean this? Count to a hundred in binary."

"Y."

He came to me and cracked my ribs with a titanic embrace. "I've always wanted a brother like you, Guig. Now sit gung while we get the ceremonies into orbit."

"What ceremonies? I thought you said—"

"Dude, you're marrying the daughter of the most powerful chief on the reservation. I hate to say this, but you're marrying above yourself. There have to be rituals. Leave it to me and don't let anything skew you."

In one hour the following, while I sat in a daze: Around fifty people ready for travel outside the wickiup plus enough hovercraft to transport them to wherever it was. "Not the entire tribe," Sequoya said. "Just the blood relations." He had covered his face with terrifying warpaint and was unrecognizable. Behind the house a chorus of Erie braves, rejects, singing sad, angry songs. From the attic four Samsons carrying down an enormous cordovan trunk while sister seemed to be pleading for tender handling.

"Her dowry," the Chief said.

"Dowry? I've got eleven million. I don't—"

"Tradition. She can't come to you empty-handed. Would you rather take it out in horses and cattle?"

I resigned myself to living with a trunkful of Cherokee homespun.

There must have been an inexhaustible larder somewhere. Mama was piling the relations with enough food to feed I. G. Farben Gesellschaft, despite the fact that they'd shlepped their own. Sister disappeared for a long time and reappeared wearing the traditional squaw's dress, but not deerskin, the finest Mandarin silk. She also wore what I thought were turquoise headband, necklace and bracelets. It wasn't until much later that I discovered they were raw emeralds.

"Gung," Sequoya said. "Let's move it out."

"May I ask where?"

"To your new house. Tradition."

"I haven't got a new house."

"Yes you do. My tepee. Wedding gift. Any more questions?"

"Just one, brother. I really hate to plague you when you're so busy, but would you mind telling me my wife's name?"

That really broke him up. Finally he managed to gasp, "Natoma. Natoma Guess."

"Very nice."

"What's yours, incidentally? The one you started with."

"Edward Curzon."

"Natoma Curzon. Very nice. R. Let's go and suffer through the ceremonies."

More tradition on the way out of Erie. Natoma and I sat side by side with mama and papa behind us like guardians of virtue. The paths and roads were lined with people, all shouting, and the small boys

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yelling things that sounded unmistakably vulgar in any language. When I started to put my arm around Natoma, mama made a noise that was an unmistakable no. Papa chuckled. My bride kept her head lowered but I could see she was blushing.

When we finally arrived at the tepee, Sequoya took a lightning survey and made emphatic Indian Sign. The blood relatives stopped where they were. "Where the hell are my wolves?" he asked me in XX.

"They are in here with me, Dr. Guess," M'bantu called. "We have been waiting for you most anxiously."

The Chief and I darted in. There was M'bantu squatted cross-legged on the floor with the three wolves lounging all over him contentedly.

"How the hell does he do it? Those three are killers."

"Don't ask me. He's been doing it all his life."

"It couldn't be simpler, Dr. Guess. All one need do is speak their language and a friendly rapport is established."

"You speak animal language?"

"Almost all."

When we *esplained* the situation to McBee he was delighted. "You will do me the honor of permitting me to be your second, Guig, I hope," and out he went to join the relations who had formed a circle around the tepee. They had thermal pots glowing and were singing something that sounded like enthusiastic Calypso with hands clapping in double-time and feet stamping. It went on endlessly, building up a tremendous charge of excitement.

"Come on," the Chief said. "Next ritual. Don't worry. I'll coach you. Gung?"

"R."

"You can still abort."

"N."

"Sure?"

"Y."

Out we went where Natoma was handed over to me. She took my arm. The Chief stood behind her and M'bantu behind me. I don't know where or how McBee got the materials but he'd white-clayed his face ceremonially and red-ochered his hair. All he needed was a shield and a spear. I can't pretend to remember the involvements of the marriage ritual; all I do remember is Sequoya coaching me in XX while M'bantu kept up a running anthropological commentary which I suppose would have improved my brain if I'd listened.

Finally mama and papa escorted us into the tepee. Natoma seemed dissatisfied until the four braves lugged in her dowry and carefully put it down. Her head still hung low and she kept her distance from me until we were alone and I'd double-knotted the tepee flaps. Then the lightning struck. Watch out for those shy types; they turn into demons.

Her head came up, regal and

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smiling. She stripped in two seconds. She was an Indian and there wasn't a hair on her translucent skin. She came at me like a wildcat—no, like the daughter of the most powerful Sachem in the Erie reservation—determined to catch up on ten years of waiting in ten seconds. It wasn't love. How could it be between strangers who didn't even speak the same language? But we were strangers who'd been magicked into committing ourselves to each other, something I'd never experienced in the past two centuries. Y, I was committed, and it dawned on me that this was the realsie love. Exit: hearts and flowers. Enter: passionate commitment.

We scrounged around the tepee, happy and contented with each other, talking and even making jokes in dumb show. At first I thought Natoma was a serious, intent girl without much sense of humor. Then I realized that the traditional squaw's life on the reservation had compartmentalized her; she wasn't accustomed to letting all her facets show at the same time, but she was loosening up. Same like Fee-5. You don't get intimate with crazy Curzon without becoming jangled.

Suddenly Natoma held up a finger for silence and caution. I silence and caution. She tiptoed to the tepee flaps and flung them open as though to catch an eavesdropper at the keyhole. Only one of the wolves guarding our privacy; no doubt instructed by M'bantu. She turned back to me, bubbling with laughter, and went to the cordovan trunk, her dowry. She opened it as though she expected it to explode and motioned to me to come and look. I looked and it was what I expected, cockamamie homespun. She removed the homespun and I gasped.

There were velvet trays in which were nested a complete Eighteenth Century Royal Sevres dinner service for twelve. Nothing like it had existed for centuries, and fourteen-point-nine-one-seven percent of the world couldn't buy it today. There were ninety-odd pieces and how the Guess family ever got hold of the set would have to wait for another time. Certainly not at a garage sale. Natoma saw the awe of my face, laughed, picked up a plate and tossed it in the air and caught it. I nearly fainted. Sequoya was right; I'd married out of my class.

I had to make her understand that she was more of a treasure than her magnificent dowry. I told her as best I could and she cried and smiled. I was crying and smiling myself and I knew Jacy was right; for two hundred years I'd been living entirely for mechanical pleasure. Now I was in love for the first time, it seemed, and it made me love and understand the whole damn lunatic world.

TO BE CONTINUED

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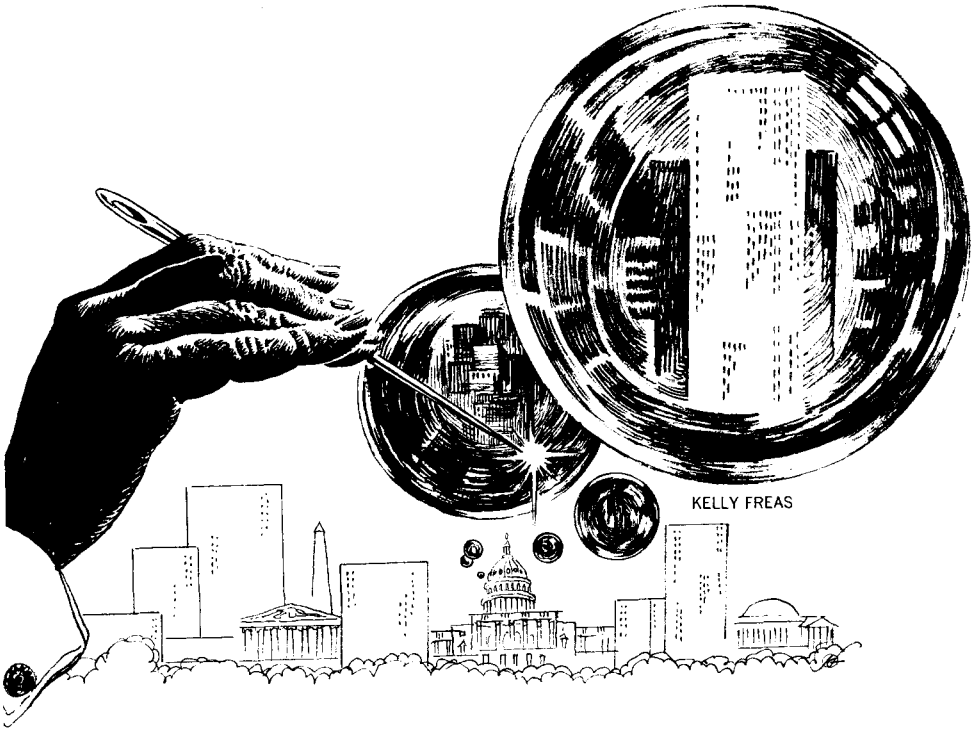
A House By Any Other Name

In a controlled economy,
the builder of a better mousetrap
can end up cornering the
cheese market.

L.E. MODESITT, JR.



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"George, we are on the Brink of a Recession!" announced James Boulin Chartwell, III.

George arranged his face to show concern. The Senior Member of the Council of Economic Advisers glowered.

"This is Serious, young man. There is a Major Metropolitan Area where employment and wages in the Construction Sector have actually declined in the last quarter."

George refrained from asking if he were sure. The Honorable James Boulin Chartwell. III, was always SURE.

"What area?" inquired George politely.

"The Greater Denver Area."

George understood. Denver was somewhere near the Rockies.

"Now admittedly, the Deviation from the National Trend is Not Yet Significant. But the level of employment for carpenters, electricians, masons, plumbers, and heating technicians is down One Tenth of One Percent. This is Inconceivable. The Denver Area is one of the most rapidly expanding markets in the country. More houses are being built, but construction workers are making less money. What will the Unions say? What will the President say?"

Chartwell's voice, while not quite to the point of professorial panic, had lost the deep, firm, and convincing tone he employed to sway the policy makers.

"And . . . ?" prompted George.

"George, you will Look Into It. We must have The Answer before the Budget is Finalized."

George struggled out of the deep leather armchair. He smiled at Mildred as he ambled out into the hall. This time she refused to look at him. George suspected that it was the purple shirt and gold tie, rather than the maroon plaid jacket.

In his office, the other three staff economists were all at their desks. George had been on the staff two years. This was the first time he had seen them all together.

"Hey, Ed. What's the big project?"

Ed—Theodore Hastings Freylinghausen—rolled his eyes. "The Recommended Executive Budget. Balance of Payments. Special Drawing Rights. Proposed Variations in Variable Budgets . . ."

Ferron Riccardo didn't look up. Norman Dentine flashed George a brief smile.

George shuffled behind his desk.

A decrease in employment coupled to an increase in housing starts? He started doodling on the scratch pad. After an hour he decided he didn't know enough to doodle.

He walked over to the console, scanned the print-outs, then typed a few lines.

"Mary, whose program is on now?"

"That's Mr. Riccardo's. He's trying to determine the role of inflex-

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ible wages in the modern economy, especially as a forecasting and budgetary tool."

"Check. I'm next on line with a short cut on the Greater Denver Economic Unit."

George walked over to the iron-jawed Riccardo.

"Ferron, how much longer on this thing of yours?"

Riccardo peered at his Complexitron Wrist Chronometer.

"About twenty-six minutes and thirty-one seconds."

George wandered down to the cafeteria. At eleven the corridors were always deserted. He was back at his desk with two Cokes in twenty-five minutes.

Somewhere in the neighborhood of twenty-six and one-half minutes, the console burped. George rescued his short print-out before it was overwhelmed by what would follow.

The print-out confirmed the summary of James Boulin Chartwell, III. George gulped the remainder of the first Coke. He nearly strangled, since he'd forgotten to pulverize the ice cubes. He thumbed through his directory.

He jabbed out a complicated code.

"National Association of Homebuilders."

"This is Dr. George Graylin with the Council of Economic Advisers. I'd like the name and number of the president of the Denver Chapter."

"If you'll hold just a minute, Dr. Grayman, I'll be right with you. Thank you." Click.

George drummed out a facsimile of "Pomp and Circumstance" with his left hand.

"Dr. Grayland, the president of the Denver Chapter is Morton B. Newton. He's also the president of Newton Construction. His office number is 303-2-757-1253. Is that all you need?"

"For now. Thank you very much."

George drummed out a few bars of something whose title he couldn't remember. He weighed the possibility of getting an open WAIT line to Denver through the Reservation Comm Center.

He punched out the number.

"Center. Will you hold, pu-leasse?"

George drummed out "Listen to the Mockingbird."

"Thank you for waiting. May I help you?"

"WAIT line, Denver. Priority, Rapid Routine. Code 444-B-C."

"I am sorry, sir, but there is a two-hour hold on Wide Area Integral Teleview service."

"Will you confirm that?"

"Yes, sir. Time is 11:42."

"Thank you."

As the picture of the harried operator vanished, George's teleview screen belched a pink slip. He slipped it into a manila file titled *For Mildred.* She always questioned his expenses. George smiled.

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Then he punched out a direct link.

"Newton Construction."

"This is Dr. George Graylin with the Council of Economic Advisers. I'm calling from Washington. For Mr. Newton."

"I'm sorry, sir. He's on one line and has two calls holding."

"Have him call me. My number is G-E-C-000-1-223-6767."

"Could you repeat that, sir?"

"Certainly. G-E-C-000-1-223-6767."

"G-E-C-000-1-223-6767?"

"Perfect. Thanks."

George grinned. He picked up the second Coke, watered down as it was. The cup started to fold in his hand. He managed to get the whole soggy mess into the pulper without dribbling more than a few drops on his paper-strewn desk or on his maroon jacket.

"Damn water-soluble plastics! Damn barefoot conservationists!"

The viewer buzzed.

"Graylin here."

"Dr. Graylin, this is Morton Newton in Denver. You called?"

"Yes. We've been reviewing the reports on the construction industry in the Denver area. What do you think of the situation?"

"Frankly, I don't see how it could be better. Our starts are up, and the labor situation is beginning to ease. For a while it was damn hard to get people who wanted solid work."

"We're interested in how housing starts can be up while construction employment is down."

"Oh, just the nature of the business. Construction's a funny thing. Almost an art. It just doesn't have any rules."

"How about innovations?"

"Innovations?"

"New technology, building techniques . . ."

"We're pretty set in our ways, Doctor. It's hard to get carpenters or plumbers to change, you know."

"Probably just a statistical fluke," commented George. "It does happen. Once in a while. Sorry to bother you, Mr. Newton."

"No problem at all."

"Thanks again." George thumbed open the connection.

He riffled through the directory. He punched out another number.

"Dr. Woolford's office."

"George Graylin. Council of Economic Advisers. Hubert in?"

"One moment, please."

"Woolford here."

"George Graylin at the Council of Economic Advisers. I've run into an oddity. Wondered if you fellows at Housing might be able to clarify."

"Shoot, George."

"Are you aware of new techniques in homebuilding in Metro Denver?"

"No, haven't approved anything."

"How about something you haven't approved?"

"We turn down so many schemes

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to build the better, cheaper house . . ."

"And the normal reasons?"

"Usually more expensive. Or impractical."

"Any other reasons?"

"If it would cause a major restructuring of the labor market. What's your interest?"

"Decrease in construction employment," laughed George.

"See what I mean?" Hubert Woolford pulled at his long chin. "I'm sure that techniques we've turned down are feasible. You know, I know that solutions at the expense of employment are unwelcome. What's the real rate of unemployment now? Not the one you quote between four and five percent."

"Twenty-one percent, including adjusted underemployment. Reason?"

"Just curious. I remember when it was just five percent. Unadjusted or statistically manipulated."

"Thanks anyway, Hubert. Let you know."

"Would you?"

"Certainly. Talk to you later."

George went back to the directory, this time to the addendum.

"Union Negotiating, Mr. Bargunn's office."

"This is George Graylin, Council of Economic Advisers. Mr. Bargunn there?"

"One moment."

"Gus Bargunn. What can I do for you, George? You're the only conservative economist left in Washington."

"No politics, Gus. What's the story in Denver?"

"Denver?" The tone was bland. Too bland.

"No reason . . . except we've got a few figures here about increasing unemployment in homebuilding. But housing starts are up, and increasing. Means less labor-intensive techniques, I'd guess . . ."

Gus Bargunn smiled. "You know, George, I might like you . . . some day."

"Cut the compliments, Gus."

"Affirm. Houseman—he's developed so-called new methods, will eventually hit us, but right now, he's non-Union. Doesn't exist."

"Yet," added George.

Gus dropped the labor-management smile.

"Thanks again, Gus. Unofficially, if interested, James Boulin Chartwell, III, holds for you. Jobs, not technology."

"Can I pass that on?"

"No, but you will anyway." George grinned.

"George, ever think about Labor?"

"I'll keep it in mind. If I need a job."

George ambled down to the cafeteria and drank two more Cokes to wash down the yeastburger.

A Memo was waiting when he returned.

"George: Have you any informa-

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tion on the Nature of The Problem? What is the danger of Incipient Recession?" There was more. George threw it in the pulper. He tapped out the intercom code of the Senior Adviser.

"Mildred. The Adviser in?"

"Yes, Dr. Graylin." Mildred used "Doctor" in a tone of contempt. The other PhD's were "Mister."

James Boulin Chartwell, III, and his glass of One Hundred Percent Pure Mineral Water, appeared on the screen.

"George, what have you Discovered?"

"Enough to go to Denver."

"That's the Spirit, George. Get to The Heart Of The Matter."

He made it through the Reservation Gate before the afternoon crush. He caught a cab without notice, keeping the hand in his pocket on the ultra-beamer just in case.

He had to pay an extra ten dollars for the two trips around the quad while the police disposer unit digested an illegally parked car.

George packed a small bag, then changed to a plain dark gray suit, pale blue shirt, and black tie. He hoped he wasn't too conspicuous.

The flight to Denver was uneventful. The passengers were knocked out once, in the middle of dinner, when a femrad tried to divert the plane to Sweden.

At Stapleton International, George waited an hour for the Denver Motor Pool to find his car. Struggling with his newly-acquired map and a perverse number of one-way streets, he managed to find his hotel.

He set up the portable defense screen as soon as he entered his room, then dialed Houseman's office number. There was no home viewer listed for the builder. He got the answering service. No picture.

"This is Dr. George Graylin with the Council of Economic Advisers in Washington. While I'm here, I'd like to meet personally with Mr. Houseman. Tell him I plan to drop by at ten. I'll call at nine to confirm."

"You're Dr. Graylin, and you plan to see him at ten tomorrow. You'll confirm at nine. Is that all, sir?"

"That's it. Thanks."

The click was the only indication that the faceless secretary was no longer behind the blank screen.

George threw the combosuiter on the bed and thumbed it open. He hung up the two suits, washed his face, combed his hair, and wandered down to the coffee shop. He had a Coke and a yeastburger at the counter. Thirteen other business types were slumped around, and the one waitress and the blank-faced busboy jerked from table to table to counter.

George picked up a copy of *The Denver Post* on the way back to his room.

The portascreen was still buzzing

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happily. George double-locked the door and sandwiched the desk chair under the knob. He tossed the dark gray suit into the laundry section of the combosuiter, then dumped it onto the floor. He stretched out on the bed with the paper. After three pages he felt sleepy.

He woke at eight, the bedside light glaring into his face.

There was enough time to shower, shave, and dress.

He ambled down to the coffee shop for a Coke and a cinnayeast. George finished in time to call Houseman's office at five past nine. Ten was fine with Mr. Houseman.

The junior staff economist to the Senior Member of The Council of Economic Advisers managed to mangle the city map and his digestion in finding the builder's office. He arrived at ten-ten.

George took three deep breaths before going in.

"May I help you?" Her voice was pleasant. George admired the modified Afro.

"Yes. George Graylin from the Council of Economic Advisers. I have a ten o'clock appointment."

"Go right on in. He'll be with you in a minute."

George sat down in a black leather and chrome chair. The office was spartan. There was an engineering diploma to Theron Oliver Houseman on one side wall. George could see why Houseman used his initials.

"Dr. Graylin?" Houseman was short, wiry, and black. His hair was clipped. Other than the long sideburns, he was clean-shaven.

"George, just George, Mr. Houseman."

"Call me Tod. I'm just a carpenter with a degree. What do you have in mind?"

"I really don't know, exactly. Somehow, an economic phenomenon we're investigating seems to be connected . . . oh, hell, there I go getting tied up in the language again.

"Briefly, your project seems to have something to do with an increased number of Housing Starts in the Denver area as well as an increased unemployment rate." George felt that he shouldn't have to step lightly, but . . . feeling wasn't always correct.

Tod Houseman surveyed George. Then he laughed, explosively.

"You take some straight talk, George?"

George grinned, partly in relief.

"It's a roundabout way, but I'd like to tell you how I got started in this business. I meant it when I said I was a carpenter with a degree. I broke into the Union when they started the Philadelphia plan here. After the plan flopped, I decided to stay in the building business. I got the degree at night. Went from framer to framing contractor to builder. After the experience with the Philadelphia plan, I went non-Union all the way. For

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obvious reasons. The Union bigots didn't want me—not on my terms. And later, I didn't want them.

"I could build a better, cheaper house without all their rules. Since there are a bunch of non-white builders around they couldn't make it too hard on any one of us."

Tod Houseman forced a smile.

"It's still harder than hell not to be bitter. I keep telling myself that bitterness doesn't help."

"You were going to say how all this got started," interjected George.

"Right. I used to build houses in the old style. One day I was going over my cost sheets. The cheapest part of building the house was the frame and the foundation. The two most expensive items are labor and lumber. Labor for plumbing, drywalling, electrical and heating installations, tile, trimming . . . you get the picture."

"Hm-m-m," commented George.

"So I thought, why not do a whole house at the framing stage, and use something besides lumber. And that's what I'm doing." Houseman gave an easy smile.

"The idea sounds great. But how do you make your profits? A lot of builders have tried the pre-fab route and lost their shirts." George wanted a Coke.

"The product is simple. I'll start with that. I work a modular room system. The prefinished rooms are delivered to the site. Then we bolt them together, stick on our precast roof and siding and we're finished." His smile turned into a grin. "It's working pretty well."

"Hold on. Where do you get these rooms, and roofs, and uh . . . siding? You have a factory?"

"Good a term as any. Actually a fat airbubble, portable, with one giant loading airlock. I have three semis with fold-down sides that hold the epoxy casting machinery. I drive to the area I'm developing, set up the semis, blow up my balloon, and go to work."

George was lost. He tried again.

"But you must have huge costs. All the molds, and the plumbing and the wiring . . ."

"We got that figured out early. Houses have basically only three kinds of rooms. Big ones, middle-sized ones, and little ones with plumbing. We have two sizes of each. The living room can be a dining room, or a family room, or a master bedroom, or a double garage. The pullman kitchen can be a bathroom, a laundry room, or a storage room. We mix and match to suit your budget and your taste." He gave a toothy grin.

"But the trade costs? I had to call a plumber once, when my sister visited me with a baby and diapers, and he charged me a small fortune."

"That's the beauty of it. Each room is cast with all the electrical gizmos, heating and plumbing installed."

"How do you accomplish that?"

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"We lay the pipes and electrical cables on prongs inside the molds. Then we pour in the epoxy and let it set two hours before unmolding."

"What's the reason for the bubble?" George knew it was a stupid question.

"Besides the manufacturing process, you mean? Each room has to cure inside the warm bubble for about twenty-four hours. While it's curing, we use the time to plug in the heating-cooling strips and test the circuitry. Then we cart it off to be bolted together."

This time it was George who grinned.

"And how many houses can each one of these turn out a day?"

"About ten."

"I'm impressed." George swallowed. "But I'd like to ask a few more questions . . ."

"Go ahead."

"How did you get around building regulations? You're using methods and materials that aren't even mentioned in the codes."

"My legal beagle found a loophole in the Colorado state statutes. If you can get eighty-five percent of the property owners in an area to form a planning district, they can supersede county regulations. On my first project, two years ago, I bought up a bunch of contiguous lower-ethno property in Mid-Metro District County, put the title in fifty names, mostly friends and relatives, and set up my own planning district.

"No one even noticed. I made about three percent on the deal, selling the houses back to the original inhabitants, but the glue stuck and everybody was happy. That was the lever that got me into the suburbs."

"Weren't people outside the Core a little dubious about plastic houses?"

Tod Houseman snorted. "Right now the cheapest house my competition can build costs forty-five thousand dollars for a two-bedroom, eight-hundred-square-foot crackerbox. Hell, I can build a three-bedroom, sixteen-hundred-square-footer with a two-car garage for less than twenty thousand dollars."

"Twice the house for half the money."

"It works well enough."

"Financing?" prompted George.

Houseman nodded. "A problem at first. I started my own bank on the second project."

George shook his head slowly.

"Schools, utilities?" George knew there would be a ready answer, but had to ask anyway.

"Public Service has lines all over the state. I built my own sewage plants. Then I tooled up a special mold on classrooms and built all the schools at once. I leased them to the county at a ten percent return and they thought they were taking me."

George was feeling thirstier. He swallowed.

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"Just how many of these air-bubble factories do you have?"

"Four."

George multiplied. Forty houses a day. Fifteen thousand a year, and just beginning.

"I see. I think that about does it . . . I'll be in touch."

"Appreciate your interest, but I could have told you all this on viewer."

"There's no way to tour your areas by viewer," said George. Or get out of the office, he thought.

Houseman grinned again and offered his hand. "Take care, George. We appreciate a healthy interest in our projects."

George shook his hand firmly and wondered exactly what he meant by a "healthy interest."

He stopped for a Coke at the first Vendaserve he spotted, and then, wielding the unwieldy map he'd gotten from the receptionist, George struggled out to Point Ultimate.

As George cruised the area, he began to appreciate Houseman's taste. The exteriors looked like real timber and brick, the shake roofs like cedar. The cluster arrangement left wide areas of greenbelt. The density was offset by evergreens and decking.

Although there was the usual litter of tricycles, mufflebikes, and rockeprams, all the front decks had flowerpots, instead of milk-boxes, and every garage door was closed.

George pulled over by the exit to study the map. He got lost three times on his way to the Denver Federal Center.

He finally stopped to ask directions.

Trading on an access code he should have forgotten, and the Council's name, he got what he needed through the Denver Data Link.

He headed for the elevator and the FHA office.

"Yes?" She was dressed in bright red and was suitably dumpy.

"I'm Dr. George Graylin from Washington, with the Council of Economic Advisers. Who could fill me in on the local low cost housing market?"

"That would be Mr. Gouger. I'll see if he's available."

Herman Gouger was slight and blond, with a wispy mustache and a lisp.

"What did you want to know, Dr. Graylin?"

George did not say, "Call me George."

"I'd like a general run-out on low-cost housing, Federal-sponsored and commercial."

"Well, as I am sure you know, Dr. Graylin, there is a substantial lack of new and approved techniques in the low-cost housing market. Because of this dearth of innovation, we have been forced to concentrate the majority of our resources on the multifamily unit.

"Unfortunately, personal and tenant satisfaction are not max-

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imized in such a situation. This has effected higher-than-desired insurance rates on the mortgage protection for the constructing agencies and a more rapid trend toward obsolescence."

George smiled. "Translated loosely, people don't like government-subsidized apartments and are tearing them up."

"Permanence in construction has been a definite and persistent problem," admitted Gouger.

"What about new techniques?"

"With the notable exception of Houseman Enterprises, progress has been less than exceptional in that particular line of endeavor."

How can he keep a straight face, wondered George.

"Who runs this Houseman Enterprises?"

"A black chap who utilizes a less labor-intensive method of prefabricating modular construction for employment in lower-income housing. He has set up several companies to promote his products and his developments."

George remained disinterestedly intent.

"Mr. Houseman remains an enigma to the Federal Housing Administration in that he never consulted with us on the availability of Federal funding."

"Why?" queried George.

"I presume that not involving the Government in his sundry enterprises enabled him to maximize profits, minimize indecision, and circumvent difficulties inherent in low-income housing regulations. Technically, he has no connection with subsidized housing, although . . ."

"Although?" pursued George.

"Although the product of his efforts is less expensive and more desirable than any of the Government projects."

"He builds a better, bigger, cheaper house?"

"Substantially, and the process allows one to select a wide variety of extremely variable color schemes, even though the choice of actual modules is somewhat limited."

"You know quite a bit about this," commented George warily.

"My friend and I were most fortunate in being able to obtain one of the dwellings."

That clinches that, thought George.

"Do you know if anyone has tried to qualify Houseman's project for FHA, PC, or VA loans?"

Herman Gouger smiled wryly. "I did. They said that authorization had been delayed. Apparently, construction techniques were not in accordance with . . ."

"I see," interrupted George firmly. "I think you've answered my needs completely. Best regards, and thank you."

Gouger pulled at one end of his wispy mustache as George got up.

Samuel Sherman Stephenson, IV, was tall and portly. He was also

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the president of the First Denver Trust.

"Dr. Graylin, my secretary tells me you're here from Washington?"

"That's correct, sir. I need some background information. I hoped that the president of the Colorado Bankers Association might be able to help."

"I'll try. I'll try."

"What can you tell me about a bank called 'Bank on the Front Range'?"

"Relatively new bank. Builder named T. O. Houseman is the majority stockholder."

"How big a bank is it?"

"Couldn't really say." The banker shook his head ruefully. "Big enough to attract our top black vice-president. Houseman owns it, but he also has large, but not majority, interests in four or five other banks."

"Do you know the other large interests in those banks?"

The banker's eyes twinkled.

"I suspect, sir, that you already know the answer to that."

George had to grin.

"Why did you invest in them?"

"We believed in the idea Houseman had. And it's a good way to generate loans that aren't snarled in red tape. You know the multiplier effect.

"Our major customers would frown, unofficially, of course, upon our backing him directly. This way, we got him set up on his own and get back a good and continuing return. Getting charters for minority-controlled banks is not that difficult. After the first bank, there was little or no risk to us." He smiled.

George did not. "Thank you, sir, very much."

He made it to the hotel in record time, despite the one-way streets, grabbed his gear, disassembled the portascreen, and checked out.

He left the Motor Pool car double-parked at Stapleton International.

Greater Washington was as uncivil as ever. George had to wait an hour for a cab. His apartment defense screen had shorted out. The electro-burglars had taken the television, the stereophone, and two cartons of Cokes. The books in his study had been dumped off the shelves.

George replaced the fused section of wiring, reset the screen, and put the books back on the shelf. He reported the incident to the insurance agency, then to the police. The police scheduled their investigation for 10:45 on the thirtieth.

George marched into the lobby, purchased an overpriced Vendaserve Coke, stomped back inside and went to bed.

He opened the office door just as Mary was putting the Coke on his desk. He pulled the folder on insurance premiums out of his overstuffed file drawer, then checked his Memoranda from James Boulin Chartwell, III. There were only two. Both said, "Let Me Know,"

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and were embellished with the normal inanities about the Great American Economy.

Mary brought in a file. George shoved it into his overflowing In-basket, and continued checking the insurance premium schedules. He decided, once again, not to change his thousand-dollar deductible to five-hundred-dollar deductible. He wondered, then stuffed the file back in the drawer and tapped out a number.

"Houseman Enterprises."

"This is George Graylin calling from Washington. Is Mr. Houseman in?"

She didn't say anything. The screen went blank momentarily.

George realized he hadn't played out the charade with the Federal operators to be denied a WAIT line. He shrugged.

"Houseman."

"George Graylin here. From Washington. I wanted to congratulate you on Point Ultimate. I took a look at it yesterday. Are all the other developments that beautiful?"

"I appreciate your interest, Dr. Graylin."

Houseman didn't like small talk. George approved.

"I'll get to the point. First, I presume you're stacking your construction crews with blacks?"

"One hundred percent."

"Second, although you'll sell to anyone, you're targeting blacks?"

"Why do you say that?"

George grinned. "Why else would you supply a basketball backboard with every house? I'm sure you used a black design team, but since I'm not an expert at culture, I could only pick out the feeling rather than the details."

"You still haven't said why you called."

"Because, whether you realize it or not," exploded George, "you've got problems. Do you realize that the entire Labor movement is about to land on you? How long do you think that fifty-year-old loophole in the state statutes is going to last when they get going?"

George hadn't thought it would be so hard to get through.

"Look, Houseman, I presume your goal is a total black Community, complete with black tech and industrial centers. I can help you through this morass if you'll accept Union construction workers when you build your industrial parks. Now do you want help, damn it?" George found himself clenching his fists.

Tod Houseman began to grin.

"Thought I'd make you work for that, boy. I've seen too many bureaucrats come up with easy solutions that didn't work. You do better, fine."

George wiped his forehead. "I'd rather not explain the details, just yet, but it should work . . ."

"Keep me posted." Tod Houseman smiled again. "Economic solutions work."

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George went back to his print-outs. Then he leafed through his datebook. He punched out a combination.

"George, you old bureaucrat! Great to see you!" The young man looked at George from across a three-foot wooden desk. "What do you want this time?"

"Murray, you've been telling me for years that a timber company should diversify. You and your family are already conglomerating, but I have somebody you should talk to. Have you kept a finger on the Denver market?"

"George, have you had me tailed?"

"You've seen Point Ultimate?"

"Seen it? Hell, we supplied all the plastic epoxies."

"Did you know there are plant sites there?"

Murray started in the highbacked Execurocker.

"If you can put together a black staff, go talk to Houseman. Our studies," George waved a stack of irrelevant print-outs, "indicate that it might be the best investment you ever made."

"Let you know, George. We've thought about it a lot."

"Think about it some more."

George broke the connection.

He jabbed out another number.

"Export."

"Bill Bussard there? George Graylin over at the Advisers."

"No, sir. He's not in yet."

"Have him get in touch with me. He'll be eternally grateful. At least, after a while, he will be," George chuckled.

"Yes, sir. Have him return the call."

George began to doodle. Then he ambled to the console and began to type. He stood and waited. The computer terminal burped and fed George a print-out. He studied it, then typed a few more lines. This time the print-out was longer. As he studied it, he began to smile.

Back at his desk, he began to rough out the arithmetic.

The viewer buzzed at him.

"Graylin here."

"Bill Bussard, George. What's up the fabled sleeve this time?"

"Solutions." George looked at the print-out. "Call up AB-43598 on your console. Then call Tod Houseman in Denver. He's a builder."

"But, George. This is Budget Time."

"Right. This will help get you out of the jam you're in. Houseman can explain the details. I know the Balance of Trade figures for last quarter."

"Can I just fly a white flag . . . oh, hell, what can I lose except my rating." Bussard faded off the screen.

George marched to the computer console. He had to type the inquiry twice. He erased his own input the first time. The first print-out led him into a second, which resulted in a third, which created a fourth.

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Three hours later, George felt he'd bridged all the gaps and was ready to play it out.

"George, That was a Magnificent End Run. You understand why we couldn't afford to Make a Touchdown, don't you?"

George understood all too well.

"And I think that you should handle the Housing and Export Portfolios from now on, as well as acting as a consultant to Ferron Riccardo on Banking and Labor. You have Handled a Sticky Situation Quite Tactfully."

James Boulin Chartwell, III poured himself a glass of One Hundred Percent Pure Mineral Water and took a small sip. He looked at George.

"Will you join me in a glass?"

George declined tactfully.

The Not-Quite-So-Junior Staff Economist had barely collapsed behind his desk when the viewer buzzed.

"All right, how? Just how?" It was Gus Bargunn from Union Negotiating. He looked green.

George settled back in his chair to enjoy himself.

"Really want to know, Gus?"

"Yeah, how did you ever get Weasilin to sign that . . . that . . ."

"You take me to lunch, I'll explain." George was not hungry, but principle was principle.

"All right, the Burr Room at twelve-thirty."

Gus was waiting at the table, impatiently chomping on a cheesestick. George sat down.

"A drink, sir?" intruded the red-coated waiter.

"Coke, fresh lime, please."

"Another Scotch and water," demanded Gus, "and send the waitress around."

"Yes, Mr. Bargunn."

"Know you here, Gus?"

"I'm here often enough. Now how did you get old Weasilin at Headquarters to sign that agreement?"

"I promised him more jobs for construction workers."

"Are you ready to order, gentlemen?"

"I'll have the special," grumbled Gus.

"Steak sandwich, Colorado beef, if you have it," added George, "with French fries and another Coke. Roquetoast dressing on the salad."

"Would you like your coffee with dinner or later, Mr. Bargunn?"

"Later." Gus gestured the girl away.

"You got them to support this deal by promising more jobs? From what I know, Houseman cuts eighty percent of the labor costs with his system. That's going to increase jobs?"

"Look, Gus, the new jobs don't have anything to do with low-income housing. They're based on Houseman's black industrial parks."

"Run that one by me again," demanded the Union official.

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"All right. Houseman designed each housing area with space for an industrial park, based on the hope that he could bring in black industry or persuade some of the larger corporations to locate branch operations there and staff them with blacks."

"You mean the guy has been planning a total black environment the whole time?"

"Don't sound so outraged, Gus. Union labor will build all those beautiful black plants. That's what you want, isn't it? More jobs?" George reached for the radishes.

"Just assuming that this massive construction effort will create more Union jobs, and I'm not too sure of that, but assuming it would," asked Gus quietly, "just how are you going to get the money for this Great Industrial Relocation?"

"We've already got it, Gus." George took a satisfying crunch on his radish.

"Yeah? How?"

"We played a little switchy-switchy behind the scenes, Gus. We, or I should say, my boss, went to the President and showed him that subsidies for low-income housing could be eliminated from the budget. Houseman's methods are ten thousand dollars cheaper and need no subsidy. Besides, no builder wants to do the stuff; they just do it to keep their Federal Developer ticket so they can keep on the FHA, PC, and VA approved lists.

"Anyway, extending VA, PC, and FHA approvals to plastic housing is all the help the low-income buyer really needs. And that's an Executive decision. The President was delighted. In fact, he muttered a bit about 'why hasn't it been done before?' "

Gus showed no reaction to George's fairly passable imitation of the President. George picked up the Coke as soon as the waiter set it down, took a quick swallow, and went on.

"Then the boss went to bat for Labor. He persuaded the President to budget the money we saved by eliminating the subsidies for the Labor Market. Instead of subsidizing houses, we subsidize new construction loans. But only if Union labor is used. And the Congressional leadership says there's enough votes to pass it."

"So Labor gets a few jobs. Great." Gus's tone was flat.

"Of course, those loans are designed for those companies who want to spur minority employment."

"Meaning Houseman's damn black industrial parks," finished Gus. "That had to be the fly in the ointment."

"You can't complain, Gus. Houseman has to use Union construction workers."

"Yeah, maybe. But what companies are going to make this kind of move? Even with subsidized loans?"

"How about Sequoya-Northwest

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for starters? Friend of mine, Murray Weiderhausen, his family owns the whole glotch. They've been watching Houseman all along. They're ready to put an epoxy plastics plant in Houseman's Point Ultimate, with all all-black staff. The shift from timber to plastics will help them. Placate the conservationists."

"Graylin, you got more solutions than a damn chemist. What else?"

"Tossed in a couple more economic goodies, mostly to please my boss. Underdeveloped—excuse me, the rapidly developing—countries can use a cheap house, and exporting Houseman's process will help Balance of Payments and Balance of Trade. Labor should be happy with extra jobs in the machine-tool and plastics industries."

George finished the Coke and started on the ice cubes.

"Then I showed your President Weasilin the statistics. Houseman really doesn't have much effect on standard homebuilding. He's strictly low-income, and he'll be plenty busy with that backlog. Moderate- and high-income house construction won't be affected.

"In areas where there has been no low-income housing, Houseman will actually increase construction employment. Your Mr. Weasilin seemed satisfied with that."

"For God's sake, Graylin. Houseman won't stay in low-income housing forever."

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George sat back. "No, I figure about five years, Gus."

"And then what do you figure?" Gus Bargunn's voice was very, very level.

George leaned forward and smiled. "Why, then I figure he'll take over the rest of the housing market. Or rather, his techniques will." George pulverized an ice cube with his molars.

"You damn calculating back-alley bureaucrat. This agreement you had us sign means that in five years we'll all be out of work."

George's smile became a wide grin. "If you Union men had gotten in the habit of projecting a little more into the future, you could have seen that. But you've never looked beyond the end of your next exorbitant contract to see what was happening in this country.

"No, you guys have had it coming for a long, long time. You've fought integration. You've fought innovation. And you've created inflation for longer than anyone can remember.

"But you could have seen what was coming, Gus, if you hadn't been so short-sighted."

"What do you mean by that?"

"Houseman warned you himself."

"Didn't you ever look at the way he signs his name, or the way it appears in his ads?"

"Signs his name?"

"Uses his initials. T.O. Houseman, and he capitalizes the *M*."

Gus wrote it out on the linen napkin. Then he wrote it out again.

He pushed back his chair and stood up.

"If you think we'll keep that agreement . . ."

"Cut it, Gus. You and I both know what the courts would do to you under the revised Sherman Anti-Trust Act if you broke it. And I can see the headlines now: UNION DENIES WORKERS CHEAP HOUSING."

Gus folded the napkin carefully and laid it on the table. He reached down, picked up his glass and drained the last of the Scotch.

"Enjoy your lunch, George. The check will go to my office." He walked steadily out of the dining room and did not look back.

George smiled. There was more. He wanted to see Houseman at work in managing an industrial operation. Gus hadn't considered that.

George sat at the table, debating. The waitress brought the two platters.

In good conscience, George felt, he really ought to pay the check. On the other hand . . .

He finished the steak sandwich. It was excellent.

Gamesmanship be damned. He let the waiter take the check for Gus.

Then he ordered the chocolate mint pie. He had that put on a separate check and sent to Mildred. ■

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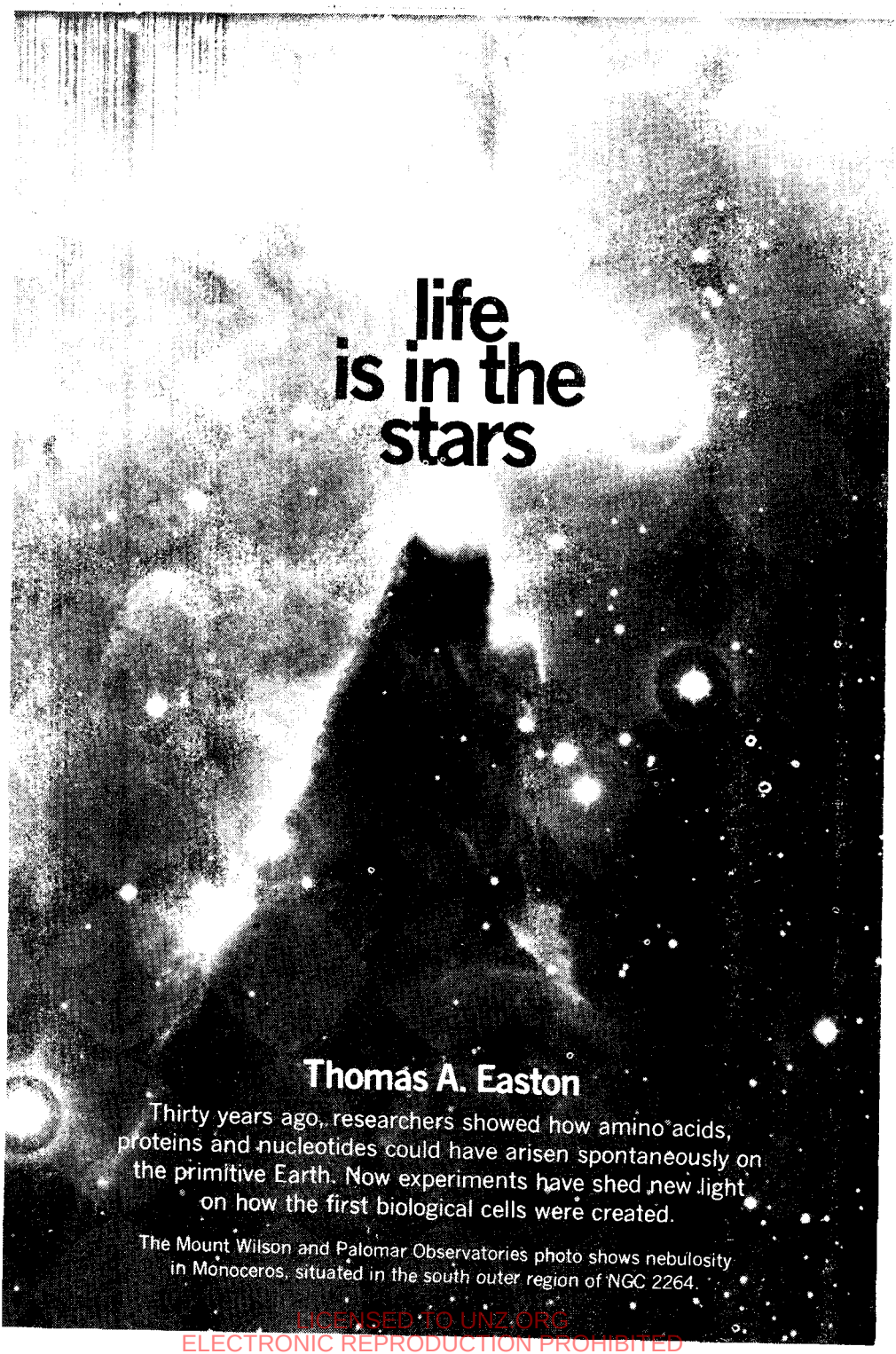

life is in the stars

Thomas A. Easton

Thirty years ago, researchers showed how amino acids, proteins and nucleotides could have arisen spontaneously on the primitive Earth. Now experiments have shed new light on how the first biological cells were created.

The Mount Wilson and Palomar Observatories photo shows nebulosity in Monoceros, situated in the south outer region of NGC 2264.

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To the writers and readers of science fiction, life is the material of fantasy and speculation: How did it begin? Did it just happen? Did an alien astronaut once visit Earth and leave our ancestors in his litter? Can it be made in the laboratory? If so, what utopian or horrifying visions might it make possible? Is it to be found on other planets of other stars? If it is, what forms might it take? When we reach the farther depths of space, will we meet intelligence? Will these other beings be ones whom we can love, with whom we can talk, from whom we can learn? Or will they be the stuff of nightmares?

To the biologist and chemist, life is a phenomenon of interacting chemical reactions, and what they call a living system is characterized, like Achilles' ship, by a continual renewal of its substance. To them, life is a question to be studied in the laboratory, and though they cannot answer all the questions of the science-fiction world, they can say, "Yes, it may be possible to make life in the laboratory," and, "Life probably does exist on other worlds." Indeed, J. B. S. Haldane said in October 1963, "Some of us, or of the next generation, will try to make a living organism." He could say this because we now have a nearly complete—in principle—understanding of how life first arose on Earth. We can even justify the claim that the chemistry of the universe is such that life is inevitable wherever certain broadly defined conditions hold.

Furthermore, this inevitable life may be much like that found on Earth. The organic compounds of which our world's living systems are built consist mostly of the elements carbon, hydrogen, oxygen, nitrogen, sulfur, and phosphorus, and these organo- or bioelements are among the most abundant elements in the universe. However, while life may be expected to develop around readily available materials, this does not imply that there is anything *necessarily* inevitable about "life as we know it," based upon water and oxygen and proteins. There must, after all, be worlds where water cannot be liquid and where the chemistry of life would have to be fitted to some other solvent. And even here on Earth there are a few kinds of bacteria that do not use oxygen.

What does appear to be inevitable is that wherever water can be the solvent, life will be based upon amino acids and their polymers, the proteins, for the experiments of those chemists interested in the problem of the origin of life have strongly indicated that, early in the history of any watery planet with some energy supply, proteins will be formed in large enough quantity to support the development of life. Accordingly, we can expect that on many of the ten billion Earth-like planets estimated to lie among the

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billion billion planets of the hundred billion billion stars in the observable universe there is life whose chemical basis is similar to that of our own. And a few of these planets are bound to hold intelligent life.

Although the source of life has been a goal and obsession of philosophy and religion as long as man has existed, it was not so very long ago that men believed that living animals could and did arise from dirt, slime, the sea, and roten meat without the aid of parents. It was even thought, quite seriously, that when a sweaty shirt was put into a closed vessel with a handful of wheat grains, the vapors combined to form full-grown mice, and that lambs were formed within certain fruit. It was not until the Seventeenth Century that Francesco Redi demonstrated that maggots came from fly eggs rather than from rotten meat alone and began the debunking of the myths. Other skeptical investigators soon reduced the question of spontaneous generation to that of microorganisms, such as bacteria and molds, ruling it out for all higher forms of life.

In 1864, however, Louis Pasteur provided strong evidence that spontaneous generation did not occur at all—strong enough, in fact, to win a prize offered by the French Academy of Sciences for a solution to the argument. By drawing the neck of an ordinary round-bottomed flask out into an S-shape long enough to keep the dust in the air from drifting through the neck to a supply of nutrients in the flask, he demonstrated that even microorganisms always arise from others like themselves. Unfortunately, this was the beginning of the dogma, "Life always and only arises from life." This "law" of nature hampered the serious investigation of the origins of life for many decades, reducing the status of any scientist who even thought of the question to that of a dilettante.

But the question was and is real. Because the Earth has not always been, there could not always have been life on Earth. So how did it get here? Arrhenius, in 1908, begged the question with the concept of panspermia, according to which life reaches any world as tiny drifting spores arising elsewhere in the universe. He ignored the question of how the first spores arose, and he failed to recognize—unlike Charles Darwin, Aleksandr I. Oparin, and others—that a necessary prerequisite of the origin of life anywhere is its absence. Darwin even went so far as to suggest that perhaps the then-current disbelief in spontaneous generation was not justified and that it might indeed occur. In an 1871 letter to a friend, he remarked,

"It is often said that all the condi-

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tions for the first production of a living organism are now present, which could ever have been present. But if (and oh! what a big if!) we could conceive in some warm little pond, with all sorts of ammonia and phosphoric salts, light, heat, electricity, et cetera, present, that a protein compound was chemically formed ready to undergo still more complex changes, at the present day such matter would be instantly devoured or absorbed, which could not have been the case before living creatures were formed."

Spontaneous generation, then, might still occur, but it would not be detectable and it would scarcely matter to the world.

The question is real, and it cannot be put off by appealing either to panspermia or to the intervention of some alien astronaut. It cannot even be left in the lap of God, for divine intervention is the last resort of the ignorant, and the origin of life is a problem we can hope to solve by ourselves. Indeed, scientists have been finding recently that it is possible, and even likely, that under the conditions presumed to hold on the primordial Earth, the basic chemicals of life would have been formed solely from the laws of chemistry and would then have evolved into more complex compounds which would have given rise to structures extremely reminiscent of cells.

All elements are produced by the "cooking" of hydrogen in the enormous fusion reactors we call the stars, and the physics of the fusion reactions is such that the formation of the lighter elements—the so-called bioelements—is vastly more probable than that of the heavier ones. Released into space by novae, flares, and stellar winds, these elements and a few others, such as silicon, magnesium, calcium, and iron, form the basic material from which the planets are built. These raw materials form vast clouds of gas and dust in space, and there they undergo chemical reactions which produce many compounds—including amino acids—once thought to be produced only by living things. Occasionally, as has been reported for formaldehyde, such compounds occur in concentrations as high as one thousand molecules per cubic centimeter, which, though it is only one ten-million-billionth as many molecules as there are in a cubic centimeter of air, is a high concentration indeed for the vacuum of interstellar space.

Accordingly, the atmosphere which enveloped the newly-formed Earth five billion years ago would have been composed of water vapor, carbon monoxide, carbon dioxide, methane, ammonia, hydrogen sulfide, sulfur dioxide, and a few of the rest of the gases derivable from the lighter elements. There would have been no oxygen

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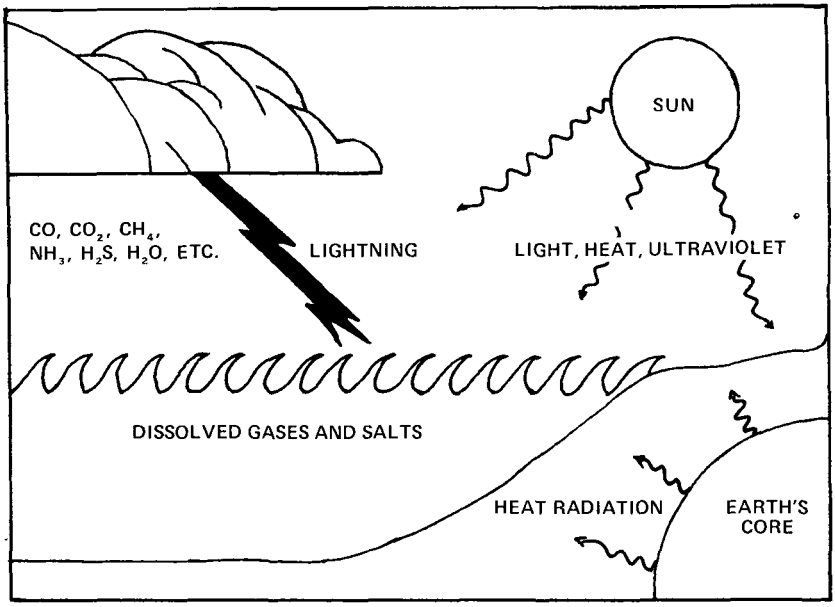

Figure 1: A very schematic representation of the primordial Earth. The atmosphere contains many gases, only a few of which are at all common today. The seas contain these same gases in solution together with many salts. The energy which drives the reactions turning these chemicals into more complex ones, eventually leading to proteins and living cells, comes from lightning, from the sun, as light, heat, and ultraviolet, and from the Earth itself, as heat and radiation.

at all, of course, for there would have been no plants to make it, and the air of that long-gone era would have been a noxious, toxic brew few organisms alive on Earth today could survive. Still, it was the brew which gave Earth life.

The Earth itself, as soon as it had cooled enough to have a solid crust and liquid seas, would have been very different from what it is today. There would, of course, have been no sedimentary rocks, no coal, no oil, and no fossils. The hot rains might have been acid from the volcanic fumes that filled the air. The rocks would not have been the familiar red and brown we know today; they had not yet been exposed to oxygen, and the unoxidized iron in them would have left them colored black and green. The ultraviolet light from the sun would not have been screened by ozone, for that must come from oxygen. But the seas (comforting thought!) might have been no less salty than they are now; all the salt leached by

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rain and groundwater from Earth's rocks since then may be well represented by the salt beds left behind by dried-up seas.

Some of the energy that entered this system can be attributed to background radiation, about three times the present value, to meteoritic shock waves, and to cosmic rays. But most of the energy would have come from the electrical discharges, the lightning, that must have thundered a stormy accompaniment to the volcanoes and earthquakes of a calming planet, from the volcanic heat and heat from the Earth's core, and from the heat and ultraviolet of the sun. These are the energies that in time transformed the chemicals of the primordial atmosphere into the life we know. And other worlds, of other stars, must share them, as they must share the interstellar starting point. If less energy is available to them, as when they circle farther from their stars, there is still no reason to think that life cannot arise on them; it must only take longer to do so, for chemical reactions are stopped only by a complete lack of energy.

How did life begin? The philosophers and the biologists phrased the question, but they were not equipped to answer it until 1913, when W. Loeb exposed mixtures of carbon monoxide, carbon dioxide, ammonia, and water to electrical discharges and obtained glycine, one of the amino acids crucial to life as we know it today. He did not perform his experiments with any intention of imitating the conditions of the primordial Earth, but his results did indicate how the first complex organic compounds could have been formed.

Not until 1953, however, was a truly close approximation to the primordial atmosphere tested. Then Stanley L. Miller, working with Harold Urey at the University of Chicago, exposed mixtures of methane, ammonia, water, and hydrogen to electrical discharges and obtained many organic compounds, including several amino acids.

Since that time, numerous experiments, using many combinations of the chemicals thought to have occurred in the non-oxidizing primordial atmosphere and all of the possible energy sources, have shown that primordial atmosphere to be capable of giving rise to most of the chemicals we now find in living things. The chemists have even found that some of the reactions that produce this wealth of prebiotic material seem to be most fruitful when the energy source is heat and the reactions occur on or about hot dry sand or lava. When the heat is applied to solutions of the gases typical of the primordial atmosphere and various salts in water, the same reactions may occur at much lower temperatures, even well below the boiling point of water. And even though the complex organic molecules are subject

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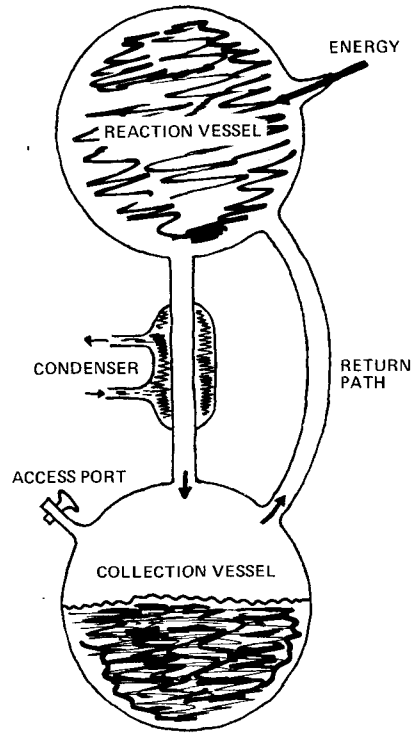
Figure 2: A sketch of the general type of hardware used in many of the experiments performed to evaluate the potential of the presumed primordial atmosphere to produce organic material. The reaction vessel would contain a mixture of such gases as carbon monoxide, carbon dioxide, ammonia, formaldehyde, methane, ethane, hydrogen, and hydrogen sulfide. The collection vessel would contain water which would, as the experiment progressed, come to resemble a dilute broth of many of the organic compounds thought to be necessary for the formation of the first living cell. The energy applied to the reaction vessel would be heat, ultraviolet light, visible light, electrical discharges, or radiation.



to destruction by the same energies that produce them, they can survive in the deeper waters of the seas, washed out of the air and off the hot dry shores by the rains and waves, stored away from excessive heat and ultraviolet until the next reaction on the way to life.

The famous "dilute soup," or broth, of the early seas would thus have contained many of the elementary building blocks of life. But how were these building blocks assembled into the larger molecules of which cells are built? This question is best illuminated by the study of proteins, for though there are data bearing on the prebiotic formation of nucleic acids, fats, and carbohydrates, the polymerization of amino acids into proteins and protein-like molecules is best understood. Because of their role as enzymes in cells, proteins have been considered as essential to, and even characteristic of, life, and when the chemists began to look for "organic" chemicals arising from the primitive-Earth conditions, they focused on amino acids,

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which also seemed the easiest to produce.

Their efforts have resulted in the abiotic (without life) synthesis of all of the amino acids found in living things and the demonstration of a simple, plausible way in which they can be linked together, or polymerized, to form proteins. In the mid-1950s, Sidney Fox, now of the University of Miami, exposed a dry mixture of assorted amino acids to temperatures of 120 to 200°C and found that they readily polymerized. Furthermore, if phosphoric acid was added to the mixture, the polymerization would occur at temperatures as low as 60°C, and that finding made it possible to declare that this way of polymerizing amino acids was entirely consistent with our picture of the early Earth. If amino acids formed in the atmosphere or the sea were deposited on rock by rain or waves, or perhaps by the evaporation of pools, and then dried, volcanic or solar heat would have been enough to produce from them long protein-like molecules. The conditions would have been particularly suitable along volcanic shores, of which there are still many on this planet.

The product of this reaction was called "proteinoid" because of its strong resemblance to natural protein. Not only did it show many of the physical properties of protein, including a molecular size comparable to that of small protein molecules, but it also proved to nourish bacteria, be digestible by the same enzymes we use to break down protein, show weakly enzyme-like activities in a number of the reactions important to metabolism, and have a biological effect similar to that of one hormone which controls coloring in some animals. These properties were not, of course, all shared by all proteinoids, for Fox could vary the properties of the proteinoid by varying the amino acids in the initial mixture, thus changing their susceptibility or resemblance to enzymes and conferring or removing their hormonal activity.

In general, the proteinoids are strikingly reminiscent of the proteins of life. It has been said that they are "sufficiently like protein im a general sense that (they) could have served as the raw material from which the powerful and highly specific contemporary enzymes evolved," and they might have served as "multifunctional protoenzymes," an "'urprotein' ... possessing nonspecific properties common to all proteins" today.* They invite one to picture the first cell as built of proteinoid, every molecule of its substance a generalized enzyme of very low efficiency. The early seas would have held most of the substances necessary for its life, and it would

*Quoted from p. 172 of "Molecular Evolution and the Origin of Life," by S. W. Fox and K. Dose, Freeman, 1972.

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have processed them inefficiently, and hence slowly. But if nothing else, that first cell would have had time; it arose, after all, perhaps four billion years ago, a billion years before the first fossils of single-celled bacteria and algae appear in the rocks of the Earth. And all that it had to do in that billion years to inherit the Earth was to acquire the abilities to grow and divide and change with the generations.

But how likely is that first cell? Many object to the idea that life could be formed without a Creator, even from a complex stew of chemicals identical to those found in living cells. They argue that the odds against the right amounts of the right chemicals coming together, in the right spatial arrangements and at the same time, are just too great. However, these people make the error of thinking that the first cell had to be as complicated as modern cells. They forget that that first cell—in a world lacking a sea full of molecules identical to those within it, a sea full of "spare parts" ready for incorporation directly into the cell—would not have required much of the machinery a modern cell needs to live and grow. They do not stop to think that in a world where the environment is so richly laden with the chemicals of life, the only difference between a cell and its environment may be that the cell is a bit of the environment walled off from the rest by a membrane. And this could be enough to begin the long road of evolution: that first cell need only be able to reproduce itself.

Gerhard Schramm, of the Max-Planck-Institut fur Virusforschung, has remarked, quite truthfully, that once there is some self-reproducing system, whether a cell or a molecule, the argument of unlikeliness of any final system just does not hold. If that initial self-reproducing system can undergo some only slightly improbable change that makes it better able to reproduce itself, then that system's descendants will come to be more numerous than the descendants of those systems without the change. A succession of such changes, each one altering the system a little and so changing the nature of what is changed, may thus lead to some virtually infinitely improbable state, such as a brain cell, a heart cell, or a parasitic amoeba.

But there are other ways than self-reproduction to explain the evolution of relatively complicated systems. A cell is not composed simply of molecules; but also of complex subsystems, some of which we call *organelles,* and the formation or evolution of a cell or any other complex system is vastly more probable if it can be built from its component parts. For the modern cell, these parts are the mitochondria, the energy-producing "engines" of the cell, the chloroplasts, which in plants trap

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and convert into useful form the energy of the sun, and several other structures serving specialized functions. If, eons ago, several independent cells had taken to living together as parasites or symbiotes within the cytoplasm of one of their number—a way of life which can be found today in some protozoans—then the development of the modern cell might have been hastened, as some think, when these cells became specialized to serve different essential functions of the whole. Reproducing within and with the "master" cell, they would have represented little or no load on the genetic apparatus of that cell and would thus have freed it for higher things.

The first cell itself would have been more probable for the prior existence of the complex proteinoids and other molecules. It has been known for some time now that the electrical charges on the parts of a protein molecule can dictate its overall shape and its interactions with other molecules, and that the resulting structure can be very specific. The best examples may be the way in which collagen molecules come together to form the fibers of cartilage and tendon, and the way in which the separate molecules of the protein that makes up the coat of a virus associate to form that structure and no other.

The question that remains, then, is whether proteinoid molecules show these same interactive properties. And if they do, will they form anything resembling a cell?

The answer to both questions, of course, is a resounding "yes!" Sidney Fox found that if one gram of his proteinoid was dissolved in either hot or cold water, with or without other substances present, and allowed to stand, about one billion small spheres, about one micron (one millionth of a meter) in diameter, are formed. And thanks to the nature of the primordial Earth, these spheres could have been formed in great profusion every time dry proteinoid was washed off some rocky ledge by a wave or rain.

These *microspheres* are hollow, with double walls of proteinoid similar to the double membrane of a cell, and they are not simple bubbles: not only do they readily withstand mechanical disturbances such as centrifuging, but they contain a portion of the solution of proteinoid from which they were formed. They are about the size of some bacteria, and they respond to certain stains very like the bacteria. Like cells, they show osmosis, swelling when the fluid around them is diluted and shrinking when it is concentrated.

The enzymic properties of the proteinoid are still apparent in the microspheres, so that they may even seem to carry out some of the metabolic reactions of a true cell, and if other substances are added to

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Mount Wilson and Palomar Observatories photo:
NGC 1976 Great Nebula in Orion. Messier 42.

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the proteinoid before the microspheres are formed, the similarity to a cell can be much greater. For example, if nucleic acids are added, the resulting structure will incorporate amino acid compounds much like one key part of the cellular machinery, the ribosome, a structure of protein and nucleic acid which guides the formation of proteins from just such compounds.

Microspheres do not, of course, contain anything like the genes which allow modern cells to change with the generations, but they will divide. If the acidity of the solution containing them, or the pressure, is changed, they will split into two microspheres of approximately equal size. If they are left standing in their solutions of proteinoid, they will, like yeast cells, form small buds which enlarge, split off from their parent, and grow by absorbing proteinoid from the solution. The former method of division follows certain physical laws which are also followed by modern cells, but only the latter method has been shown to go on for several generations; and there is no reason not to expect the process, if there is a good supply of proteinoid, to go on forever.

The microsphere is thus a good model of the first cell, or protocell, but it is not so only because it is a hollow sphere with a membrane similar to that of a cell. Nor is it a good model only because it shows cell-like activities, such as something resembling metabolism and cell division. What does make it so promising is that every time a microsphere is formed, a little bit of the surrounding solution, of the dilute broth of the primordial sea, is trapped inside it. And that bit of broth may contain any or all of the various chemicals which are found in cells today. A microsphere could thus be formed with a little nucleic acid able to replicate itself, perhaps with a little help from the proteinoid of the microsphere, or with a molecule similar to chlorophyll that would enable it to use the energy of the sun without having to wait for that energy to transform the simple chemicals of the atmosphere into more proteinoid.

Furthermore, every accident of nature that resulted in even one microsphere being formed would result in literally billions of them. And each one would be a separate "experiment" at making a cell. There is thus little reason to wonder that the virtually infinite number of tries over the eons resulted in a cell. If life was possible at all, it was all but inevitable.

But even with the inclusion of nucleic acids and chlorophyll, the microsphere is not yet a cell. If we recall the definition of life given at the beginning of this article, as a phenomenon of interacting chemical reactions, we can see that the microsphere does not fit. The chemical reactions upon which its existence depends all occur in the

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outside environment. The microsphere exists only because the structural material it uses for growth can be drawn from the seas around it. To "live" it must have some way of trapping energy, either from light or from other chemical compounds, some way of making its own proteins and other compounds, and some way of passing on its "blueprint" to succeeding generations.

All of these could have been attained in time. Once there is a microsphere that can reproduce itself, as by budding, everything becomes possible. That first microsphere includes a bit of its environment; its buds contain fractions of that bit; and the buds grow by drawing proteinoid from the sea around them and incorporating other molecules either into their structures or into the fluid within them.

Outlines of the subsequent evolution of microsphere into cell range from vague discussions of how the environment, proteinoids, and nucleic acids might have interacted in a molecular analogy of learning, which might later have somehow become true genetic heredity, to relatively frank confessions of ignorance. The development of a protocell from a protoprotein is now understood—it can be demonstrated—but the development of the modern cell from the protocell, the microsphere, is shrouded in mystery. The greatest stumbling block is the question of how the nucleic acid genetic system was developed, for though there are indications that nucleic acids can also be formed under primitive-Earth conditions, only nucleic acids extracted from modern cells have been combined with microspheres, with the suggestive results previously noted. We can only suppose that the first combination of a protocell and a "gene" was the result of chance. Perhaps one of the stray molecules incorporated out of the environment and into some ancestral microsphere's interior fluid was a nucleic acid molecule.

To become a true cell, however, to lead to rats and cats and oak trees and men, that nucleic acid molecule must have been able to dictate the construction of a protein molecule that could help it reproduce itself, much as certain enzymes—the polymerases—help the nucleic acids of modern cells reproduce. Such a fortuitous combination must be rare, whether in prehistory or a test-tube, but given that nucleic acids were there and that microspheres did exist in vast profusion, it must have happened. And while such a nucleic acid may not be linked to the life of its microsphere by anything more than its inclusion, it and its protein partner will be passed on through all succeeding generations of microspheres. It will be subject to mutation, and it may thus become

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several different nucleic acids, each one dictating the construction of a different protein and each one helped to reproduce by the original protein. Some of these proteins will be better enzymes than the proteinoid molecules, andas the microsphere's proteinoid molecules, collected from the environment, are replaced by "home-grown" proteins, the microsphere will become more nearly a cell. Its structure will become linked to the nucleic acids it carries, and when one such cell acquires some way of trappin energy, it will be independent of the primordial environment. It will no longer have to rely on the availability of "ready-made" complex molecules. It will be able to make its own from simpler materials, and it may even do so by breaking down the amino acids and proteinoids around it to get the basic building blocks it needs. It is at this point that Darwin's observation of what would happen "in some warm little pond" becomes true; the origin of life is no longer possible.

Laboratory experiments have thus shown how life might plausibly have arisen on Earth. With waves and tides and hot rocks and solar evaporation to concentrate the amino acids and proteinoids found in the seas and to turn them into the precursors of life, with lightning and heat and radiation and ultraviolet light to turn simple molecules into more complex ones, with the physics and chemistry of the universe itself to produce the necessary elements and simple compounds in appropriate amounts, it may even be said that life on Earth was inevitable, that it had to appear as soon as a microsphere was formed with just the right bit of nucleic acid within itself.

The experiments also strongly indicate that we are not alone. If life was inevitable on Earth, then how much less so can it be on other worlds? If a planet is large enough not to lose its atmosphere and the necessary initial materials, if it has enough of an energy supply, from sun or internal heat or radiation, if it has time enough, then life may be inevitable there, too. In fact, we are now waiting for our probes to reach Jupiter and report back on the presence of the molecules, and the possibility, of life there.

The dreams of the science-fiction writers are not only dreams. We have already made in the laboratory something that must have preceded life here on Earth; it may not be long before we actually make a cell. We can predict that life, and even intelligent life, will be found on other worlds. We can predict that its chemical basis will be similar to ours, at least if its planet of origin is at all similar to Earth. We cannot, however, predict its appearance, for there does not appear to be anything inevitable about our anatomy.

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Nor can we predict its temper, its goals, its motivations. When we reach the stars, we may meet friends and allies. We may increase our knowledge, our experience, and the variety of our lives. Or we may meet our nightmares.

Whatever happens, the effects on our history and culture will be profound. "Life in a test-tube" has been called sacrilege when it was only a fetus brought to life outside the womb. What will be the reactions of the fundamentalists to a cell that did not come directly from the hand of God? How will they respond if the scientists can evolve that cell and its descendants into plants and animals and, perhaps, intelligent beings? And what will happen to racism and prejudice when the "different" are of no relationship whatsoever to man? Will it increase beyond measure as we turn our hate and fear on our creations and neighbors? Or will it vanish entirely as the greater contrasts with new intelligences, with new and wonderful faces and colors and body shapes, with "stranger" strangers, throw our weaknesses into our awareness? ■

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AUGUST 1974

THE ANALYTICAL LABORATORY

Place	Title	Author	Points
1.	Stargate (Conc.)	*Tak Hallus*	2.21
2.	And Keep Us From Our Castles	*Cynthia Bunn*	2.49
3.	Enter a Pilgrim	*Gordon R. Dickson*	2.98
4.	The Ninth Circle	*Robert B. Marcus, Jr.*	3.38
5.	Paleontology: An Experimental Science	*Robert Olsen*	3.91

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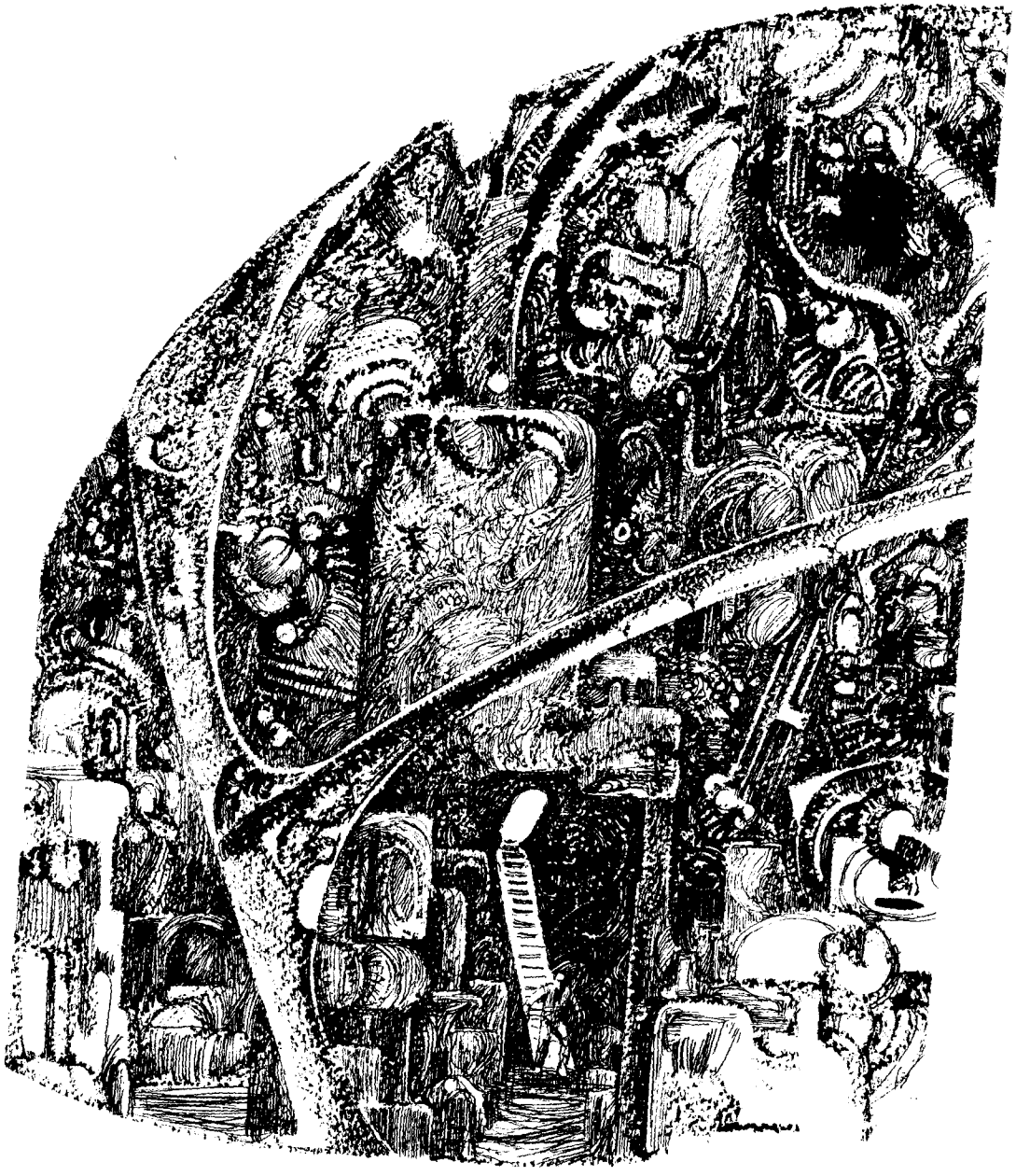

JOHN SCHOENHERR

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WHEN NO MAN PURSUETH

Honesty is the best policy,
but it helps to have brains, too.

SPIDER ROBINSON

"Yes indeed, m'boy," wheezed old Colonel Enderby-Thwaite, blinking at his cards, "if you want to get a real education before you get to Secundus, you've certainly picked the right way to go about it. Riding a tramp like *This Train* will teach you more about life with a capital 'L' than all the seminars and professors on Secundus, I daresay."

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"Precisely my thought," Fleming agreed in what he hoped were mature tones. Although he faced the pot-bellied Colonel to whom he was teaching poker, he was aware in every nerve ending of the impossibly beautiful girl in blue seated across the passengers' lounge, at whom he had been sneaking glances ever since her arrival. In point of fact, he had booked passage on the *I.V. This Train* because it represented a saving of over a hundred credits; but before this girl he wished very desperately to appear worldly—or, if he could not pull that off, at least eager to be. The frequent glances at her were no help either, for she stared right back at him; and while she was *not* staring the sandy-haired student between the eyes, that rhymes with what she was staring between. Fleming racked his brains in vain for a means of introduction, even as he took the Colonel for two-credits-six.

"Not many realize what it's like out here," the Colonel rumbled on in the fond belief that Fleming was listening. "Fringe worlds. The incredible diversity. Ultimate solution to the minority opinion problem, actually. Someone's got a crackpot idea on how things should be run, give him a planet and let him try it out. Makes for some interesting planets. Why, over on Why Should I, they've actually done away with taxation. Except on a voluntary basis, of course—but if a politician has some project he thinks should be undertaken, he has to convince people to pay for it—and any project that people aren't willing to lay out cold cash for is scrapped. Only time will tell if it's viable, naturally, but it certainly is one of the most streamlined governments I've ever seen. And for centuries it was only a crackpot idea.

"Yes, m'boy, there's room out here on the Fringe for just about any kind of society. You don't see that sort of thing on the big passenger liners, nonstop jumps from Federation planet to Federation planet with their bland, homogeneous 'culture' to make them identical. Out here there's variety. You meet people who think differently, live differently than you. Stimulating."

"Sometimes," said the girl in blue in a voice like the mellowest of clarinets, "it can be very stimulating indeed."

This seemed to Fleming a clear-cut invitation to repartee, and he did not hesitate. "Huh?" he riposted, shuffling the cards.

She smiled, and both men shivered slightly. "Well, I do not understand it myself. But I have discovered that for some reason, many men find the customs of my planet extremely stimulating."

"What customs, my dear?" asked the old Colonel, clearly in better control than Fleming, though not by much.

"Well," she said demurely, "on

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Do It—my home planet—we have a society based on total sexual freedom. The theory is that if we can eliminate absolutely every sexual inhibition, we'll achieve a truly happy society."

Fleming put down the cards, got outside a couple of ounces of bourbon with considerable alacrity and dialed another, mashing down savagely on the button marked *Triple*. "Does it work?" he croaked.

Her smile disappeared, and he hastily searched his assets for something that might bring it back again. "Well, we do have one little problem. One of the first inhibitions to go was the incest taboo, and there weren't an awful lot of us to begin with. Daddy keeps saying something about our gene-pool being too small—anyway, we started having a lot of babies that weren't . . . quite right, one way or another." She frowned, then smiled again, and Fleming turned his triple into a single with one gulp. "But we figured out the solution, and that's when we instituted the custom that I was talking about.

"You see, Do It law requires any and all females to become impregnated by any off-worlder who offers them half a chance."

There came a sudden clatter as of dueling castanets, but it was only the sound of ice rattling furiously in two glasses at once.

The girl rose, traveled to the bar by a method that "walking" does not even begin to describe, and seated herself on the empty stool between Fleming and the Colonel, dialing a sombrero with a blood-red fingernail. Fleming essayed a gay smile and produced a simpering grimace; the Colonel tried to clear his throat, and plainly failed.

"Why don't you gentlemen come and visit me in stateroom 4-C tonight, say about 2300? Perhaps I can show you more of the customs of my planet." She turned to Fleming and added softly. ". . . and I may have a business proposition for you, young man. If you are interested . . ."

Fleming allowed as how he might be interested, and finished the remains of his drink. She rose, smiled at them both, and left.

Fleming and the Colonel looked at each other. As one they turned back to the bar and dialed fresh triples, bourbon and stengah. Raising their glasses in silent toast, they drank deep, then smashed the glasses against the bulkhead.

"2300 hours, she said?" asked Fleming at last.

The Colonel looked pained. "I say, old boy. I mean . . . dash it, both of us? Together?"

"How do we know what her customs are?" Fleming reasoned. "It may be necessary. Or something."

"Yes, but . . ."

"You want to blow it?"

The Colonel closed his mouth, opened it, then closed it again.

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"Come on. Let's get back to your poker lesson."

Curiously, Colonel Enderby-Thwaite had a run of beginner's luck after that. At the close of the lesson, Fleming was a little startled to realize that he was down by about thirty credits, and what with one thing and another, he had much to preoccupy him as he made his way above-decks to the passenger level. But when his head cleared the hatchway of C-Deck and he saw a large, ferocious-looking Greenie tiptoeing down the corridor away from him with a blaster in its fist, he came instantly alert.

Greenies—natives of Sirius II—were the first and so far only alien race ever encountered by man; and the history of that encounter was not a happy one. Captured Greenies had been used as domestic animals for years before it was learned that they possessed intelligence, and even then it had taken a war with Sirius and several determined slave-revolts before men learned to see the green humanoids as equals. Even now, a hundred years later, many Greenies were still a little surly about it, and college students like Fleming had learned not to mess with them. This Greenie was large even for his race, and he was armed in the bargain.

But Fleming was not an uncourageous lad—there was, in truth, a streak of romanticism in him that yearned for glory and danger, battle and sudden death. He silently eased himself the rest of the way through the hatch and began shadowing the Greenie.

From behind, a Greenie resembled nothing so much as the fabled, perhaps mythical Incredible Hulk, said to have walked the face of Old Terra centuries ago in the Age of Marvels—that is, roughly human, if one used Hercules as a comparison. From the front, Fleming knew, its humanoid look would be somewhat modified by the long, gleaming fangs and trifurcate nose, but it was otherwise remarkably similar to a human. One of the problems that Greenies had faced in fighting for equality was that they turned out to be cross-fertile with human beings—and the males had enormous genitals.

This one wore native Syrian garb, shorts and a fringed doublet, with a curious armband around its right bicep. As he padded silently behind the alien, Fleming noted uneasily that the armband would have been too big around to serve him as a belt. He hoped this Greenie was not one of those thionite-addicts. They were said to be violent and unpredictable.

The giant creature stopped before a stateroom door, and Fleming hastily ducked into an alcove. It placed an ear against the door and listened. Then it stepped back,

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brought up its blaster and burned the lock off the door, leaping quickly through the smoldering doorway as it burst open. Fleming scurried down the corridor to the doorway, but stopped outside.

"Did you think you'd be allowed to keep all this money to yourself, Carmody?" he heard the Greenie boom within. "That's pretty selfish of you."

"You'll never get away with this," a human voice responded.

"You think not? You think perhaps you have friends on board? If so, they will be taken care of, Carmody. This is the end of the road for you." The human voice rose in a shriek, there was a harsh, metallic *zzzzzap!* and then silence.

Fleming waited, paralyzed, in the corridor. From within the stateroom came the sounds of drawers being torn open, closets being ransacked. At last there was a triumphant exclamation, followed by a rattling noise.

Fleming remained hidden behind the opened door, frozen with fear. It was too late now to think of flight—the Greenie had found whatever it was looking for and would exit at any moment. He cursed his curiosity.

The alien stepped out into the hallway and stopped, separated from Fleming only by three inches of bulkhead door. It paused there a moment, and Fleming's heart yammered mindlessly in his chest. Then it strode off down the corridor in the other direction without closing the door behind it.

Fleming realized of a sudden that he had not breathed for some time, and debated soberly whether he ought to resume. He tried to move, discovered that he could, shrugged his broad shoulders and inhaled deeply. It cleared his head somewhat; he stepped round the bulky pressure-door and entered the room that the fearsome Greenie had left.

A stocky, balding man lay on his back on the floor of the room, an expression of agonized despair frozen across his features. His tunic was of extremely expensive cut and fabric, and his outflung hands were uncalloused and well-manicured. He did not appear to be breathing.

Fleming slowly crossed the room, bent down and reached for the man's wrist, intending to take his pulse. He recoiled at the touch and stood up. Carmody's wrist was quite cold. *Omigod,* Fleming thought, *omigod what do I do now?* He was suddenly overcome with terror at the realization that the Greenie might return to the scene of the crime at any moment, and scrambled back to the doorway. Hearing nothing, he risked a look—no one there.

He fled.

Without taking time to reason it out, Fleming found himself making for Colonel Enderby-Thwaite's stateroom. He felt a desperate need

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to share his secret with someone, and the old gentleman had reminisced convincingly and at great length during the poker lesson about dangers and intrigues that he had known in his day. He modestly admitted a public career spanning three interplanetary wars and two revolutions, and hinted delicately of a familiarity with interstellar espionage, although of course he was "retired from all that now." Fleming had found him rather glamorous. Surely the Colonel would know what to do.

But as he reached the old man's stateroom, Fleming paused, struck by a thought. Sooner or later, the Greenie was going to get around to realizing that its crime was not especially well-concealed. Perhaps it was skulking around right now, trying to see if anyone was behaving unusually. If he contacted the Colonel overtly, he might be inadvertently placing the old soldier in jeopardy. What would such a seasoned campaigner think of him if he did that?

No, he had to think like a pro, like the steely-eyed spies in the romantic fiction to which he was addicted. *Subtlety*, he told himself. Without so much as pausing at the Colonel's door, he strode on past to his own stateroom and went in.

Once inside he carefully locked the door, sighed with relief, and lit a filter-tip Grassmaster, inhaling deeply. *How can I do this cleverly,* he thought, *like the legendary Bond?* Inspiration came; he took out pencil and paper and wrote, "HAVE OBSERVED CRIME. THIS IS SERIOUS. MESSAGE TO CAPT. AT ONCE." He folded the note endwise, stood and looked round the room. Books lay scattered everywhere. He picked one up at random: "Captain Galaxy Meets His Match." Inserting the note at page 134, he closed the book, walked to the door and opened it gingerly. Looking carefully up and down the corridor, he stepped out and strolled to the Colonel's door with maximum nonchalance, whistling a popular air just a bit too loudly. He knocked purposefully and waited.

Colonel Enderby-Thwaite *harrumphed* into view, his jowls flapping like twin saddlebags from his lower lip. "What? What? Fleming, my boy, how are you? What do you want? Nothing gone wrong with the young lady, I trust?"

"No, Colonel, nothing like that," Fleming said heartily. "Just thought you might enjoy a bit of light reading. I just finished this one, and it was awfully good. I'm sure you'll

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enjoy it." He thrust the volume at the Colonel with an elaborate wink.

The Colonel blinked back at him in astonishment and glanced at the book. " 'Captain Galaxy'? My dear boy, this isn't exactly my cup of *chai,* you know. Grateful for the thought of course, but . . ."

"I'm certain you'll like this one, Colonel," Fleming broke in, winking furiously. "Very interesting battle scenes, *especially on page 134.* Be sure and check that one out, if nothing else."

"I say, Fleming, what the devil is the matter with your eye?"

"Eyestrain, I couldn't put that book down. Especially the part on page 134, be sure and read that chapter. In fact, start there. Look, I have to run back to my room, now, I just remembered I left a joint burning, I'll see you in 4-C at 2300, don't forget to read page 134." He turned and fled to his room, slamming the door behind him.

"Most extraordinary," breathed the Colonel, and looked down again at the gaudily-jacketed book. " 'Captain Galaxy Meets His Match'?"

He shrugged, and closed his door.

Fleming passed the rest of the afternoon in an almost ecstatic state of anticipation. Glory was certain to come from this! Perhaps the Captain would decide to place the Greenie under arrest, have the Galactic Patrol send a ship to rendezvous with *This Train* instead of waiting until planetfall was reached. That would be lovely, as then the girl in blue, not to mention whatever other passengers were on board, would know that he was a hero, a witness to a serious crime and an accomplished conspirator. The Captain might even require his help in subduing the Greenie; you never could tell. Fleming waited feverishly to be contacted by the Colonel.

But by suppertime he had heard nothing at all—no cryptic message under his door, no hue and cry from without, nothing. Puzzled, but determined to be patient, Fleming made his way belowdecks to the lounge for the evening meal. By the time he was halfway there, he had convinced himself that the Colonel was merely waiting for a plausibly coincidental opportunity to run into him, to avoid the appearance of anything out of the ordinary. He decided that the Colonel was a genius.

But although Fleming dawdled over his dinner for well over an hour, the old warhorse never appeared. To his great consternation, the Greenie did. It shouldered brazenly through the door about halfway through Fleming's dessert, and took a seat in a far corner, facing the room.

Fleming tried to become absorbed by his chair and, failing, looked about wildly. At that mo-

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ment the girl in blue also entered the lounge, still in blue and as desirable as ever. Fleming learned the ancient truth that there is nothing like being in immediate personal danger for hiking up that old biological urge.

Seeing him, she smiled, and made her way to his table by the same preternatural means she had used once before, seating herself in a manner remarkably similar to a hummingbird coming to rest. With a major effort of the will, he tore his gaze from her momentarily and looked over at the Greenie.

It was staring intently at the two of them, and it was frowning.

"Hello," she crooned, recapturing Fleming's eyes. "Where is your friend, the old gentleman? You're both coming tonight, aren't you?"

His mind raced. Fleming was not really an idiot, but the books he had read had instilled in him the notion that it was somehow *de rigeur* to spill deadly dangerous secrets to unarmed, helpless girls—besides, this conspiracy was getting intolerably lonely. "Look," he blurted, "something's come up."

"Well, you'll just have to save it until 2300," she said. "Right now I'm hungry." She slid the table's console open and dialed steak, extra rare, with everything.

"No, no," said Fleming. "You don't understand. Colonel Enderby-Thwaite has disappeared."

She made a face. "Your companion? Such a shame. He seemed like such a courageous old gentleman," she said wistfully. The table finished synthesizing steak and plate; she picked up the former and began tearing at it with even, white teeth. *Different customs,* Fleming reminded himself wildly, and tried again.

"No, listen, uh . . . gosh, I don't know your name."

"Nandi."

"Listen, Nandi. There's been a serious crime committed on this ship. Migod, you've dropped your steak. Oh the hell with it, listen Nandi, will you please? Colonel Enderby-Thwaite may even now be in terrible danger. We've got to get word to the Captain at once." He described the day's events, blurring the outlines of the actual murder scene—and his personal reactions at the time—with all the skill of an airbrush wizard turning pornography into artistic statement. He allowed her to retain the impression that only concern for possible innocent bystanders had prevented him from taking on the Greenie there and then. Fleming understood Art.

For all that, Nandi appeared exceedingly skeptical throughout Fleming's tale. "What would the Captain do if we got word to him?" she asked when he was finished. "Would he start a panic, perhaps endanger his passengers by trying to arrest the demon?"

"Of course not," said Fleming, who favored this alternative him-

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self. "He could call the Patrol and have them send a cruiser to match speed and course with *This Train.* Let them capture the Greenie; they'll have sleepy gas and hypnodrene and vibes by the case. And in the meantime, we concentrate on lulling the Greenie into a false sense of security by preserving an air of normalcy."

"Why not just wait until we ground on Forced Landing and have it picked up as it debarks?"

"No good. We don't reach Forced Landing for at least seventy-two hours. Sometime between now and then, it may remember that it left that damned airtight door open. Even if nobody happened to glance in, sooner or later a meteorite-drill would make it pretty conspicuous indeed."

"Well, there goes your air of normalcy."

"Maybe; maybe not. That Greenie may be wasted on thionite, not thinking clearly. They often are. If we move fast . . ."

"Have you known many?" Nandi asked softly.

"Eh? Anyway, one way or another we've got to get word to the Captain before it decides to clean up after itself."

"I suppose you're right," the girl said grudgingly. She tossed cascades of lush brown hair casually back over one white shoulder and puffed a joint into life. "All right then. First, where is the Greenie now?"

Fleming had been waiting patiently for this line for fifteen minutes. Precisely as Humphrey Bogart would have done it, he deadpanned, "Ten feet behind you," and *rolled* a joint of his own.

Her eyebrows rose quite satisfactorily, and if the orbs below them twinkled, Fleming failed to notice.

"How then shall we communicate with the Captain without tipping it off?" she asked. "I don't even know how one gets to see the Captain. Are you certain we've got one? My travel agent was a trifle vague."

Still Humphrey Bogart, Fleming essayed a humorless grin, producing a hideous grimace. "Relax. It's a snap. I've already taken care of it."

"You have?" she asked with new respect. "How?"

"Wrote a message on one of my rolling papers while I've been talking. I leave it in my plate, and the steward passes it up the chain of command to the Captain." In the ancient and bloody wars that had accompanied the birth of commercial space travel, the powermen's union had fared much better than that of the cooks. While cheap machinery was good enough to feed the passengers and crew, a human crew-member would feed the Converter with the leftovers, as well as the day's output of trash, performing valet duties in between to earn his keep.

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Nandi's eyes widened, the increased candlepower melting the fillings in Fleming's teeth. "What a brilliant idea, Mister . . . what is your name?"

"Ayniss, Fleming Ayniss. My friends call me Flem."

"Listen, Phlegm, what do you suppose actually happened to Colonel . . . Benderby? Engleby?"

Fleming's dead pan acquired rigor mortis. "Enderby-Thwaite," he mumbled. "I don't know." He looked grimly across the room at the Greenie. "But that damned thionite-head was late for dinner."

"No, no. I mean, how do you know that the Colonel simply hasn't been taken with indigestion?"

"I knocked on his door on the way here," explained Fleming, stung that she thought he was jumping to conclusions like some romantic adolescent.

"Perhaps he has diarrhea, then, and ignored you. Or . . . or suppose he's in conference with the Captain right now? Let's . . ."

"Let's go to his room and wait for him," said Fleming, fighting to retain control of the situation.

They rose and left together, brushing past the Greenie with utter aplomb. Behind them, on the table, gravy began dripping lethargically across a cigarette paper half-buried in mashed potatoes, that read, "THIEF ON BOARD. CAPTAIN MUST KNOW. WASTE NO TIME."

Although the pair waited vigilantly in a lounge across from the Colonel's stateroom, Enderby-Thwaite had not returned by the time the ship's computer darkened the corridor lights for evening. Fleming and Nandi sat silent and motionless in the reduced light for ten seconds, then spoke simultaneously.

"My place or yours?"

Both blushed, but the phenomenon looked much more natural on Fleming. To his credit, however, his gaze never trembled, and if his knees did somewhat, that seemed only natural. A man's knees were supposed to tremble around girls like Nandi.

They ended up in her stateroom by Hobson's Choice—his was a mess. Hers was considerably neater; only the bedclothes were rumpled.

Nandi flicked on the light and crossed the room to the bed, sliding a trunk from beneath it. "You'll find some pot on the dresser behind you," she said over her shoulder as she attacked the clasps of the trunk, the part of her nearest Fleming describing a graceful figure-eight.

Fleming came back from a far place. "Er, no thanks."

"Oh, go ahead," she giggled. "It has to be all smoked up before we reach Forced Landing anyway. It's illegal there, remember? Go ahead and light up while I change into something more comfortable."

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Eyes bulging with the sight of what she considered comfortable, Fleming turned obediently and began puttering with an elaborate water pipe. When he turned back, she was just stepping out of the blue dress, humming ethereally. The narghile slipped from his nerveless fingers and landed on the floor with a crash.

She looked up; dimpled. "Oh. I hope I haven't upset you. It's only that I have nowhere else to change. Do you mind?"

"Not . . . not at all," croaked Fleming. A grapefruit seemed to have become lodged in his larynx somehow, and he strove mightily to swallow it. "G-go right ahead."

"You're so understanding." She beamed, slipping gracefully into what Fleming instantly realized was the most comfortable-looking garment he had ever seen. Intangible as a promise, its surface rippled with changing colors, flesh being the predominant tone. Wax began running out of his ears. "There now, that's better." She lowered her gaze, drew in her breath suddenly. "Why Fleming. I've . . . I've aroused you, haven't I?"

"Well . . . yes. I mean, yes, you have . . . uh, yes," he stammered.

"Oh Fleming, how flattering." She grinned. "Do you know what I'm going to do to you?" She paused, looked thoughtful. "That reminds me, Fleming, I have a small favor to ask of you."

Fleming indicated a willingness to fetch a comet barehanded.

"No, nothing like that. I want you to keep something for me. My jewels." She returned to the bed, bent over the open trunk again (kicking Fleming's adrenals into overdrive), and removed a large package about the size of a shoebox. Opening it, she spilled fire onto the bedspread: several dozen gems that blazed with an unquenchable inner brilliance.

"Why, those are Carezza fire-diamonds," gasped Fleming, who had thought himself already as awestruck as possible. That many fire-diamonds would suffice to buy a fair-sized planet; one of them would have purchased *This Train* with enough change to pay for the balance of Fleming's education.

"Yes, my brave one. The hope of my planet. I have been sent to convert them into credits for the planetary coffers of Do It, so that we can begin a massive galaxy-wide advertising campaign to encourage immigration. The gene-pool, you know. Will you take care of them for me, until this inhuman thief has been disposed of?"

Fleming stood on one leg, opened his mouth, and made a gargling sound.

"I knew I could count on you," Nandi bubbled. "Lock them away somewhere, as tight as the Fist of Venus."

"The Fist of Venus?" asked Fleming weakly.

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"You don't know the Fist of Venus? A standard accomplishment among my people. Among the women, that is. Here, let me show you."

She swept the bedful of diamonds to the floor, let her negligee join them. The floor became a riot of pulsing color. Smiling, she beckoned.

Fleming actually paused for a second. "If we were going to do this all along, why did you go through that business of changing into something more comfortable?"

"I thought you might enjoy the show," Nandi giggled. "Was I wrong?"

Fleming demonstrated that she had not been wrong.

Morning brought no word from the Captain, no sign of Colonel Enderby-Thwaite, and no steward at breakfast. To Fleming, who had begun the day with no sleep, it seemed that a definite negative trend had been established. In less than twenty-four hours he had become involved in at least one and possibly three murders, had taken on the responsibility of guarding more wealth than he could comprehend, and had learned that most astonishing and disappointing of truths: that there is such a thing as an overdose of pleasure.

The sandy-haired youth had annihilated six eggs, half a pound of home-fries and two quarts of coffee before he felt reasonably safe in attempting rational thought. Now he rather regretted the undertaking.

It seemed obvious that the Greenie knew Fleming had witnessed its crime—the disappearance of the only two men to whom he had imparted his secret had to be more than coincidence. But how had it found out, in spite of all his circumspection? Fleming buried his head in his hands, and the answer smacked him in the face: his iridescent yellow boots, reportedly all the rage among the collegiate set on Secundus, gleamed up at him with a brilliance that was matched by no other footwear on the ship. At once Fleming remembered that the stateroom doors stopped four inches short of the deck, for a tighter airseal. The Greenie could scarcely have overlooked Fleming's toes—the mystery was that it hadn't murdered him there and then.

Well, that was that. Time to break cover and get to the Captain *fast*. Fleming had no idea where the Captain was to be found at this hour—his travel agent had been as vague about *This Train* as Nandi's—but he seemed to recall that anything above C-Deck was "officers' country." *This Train* had been a luxury liner before she was a freighter, before all but one of her passenger decks were ripped out for maximum cargo space, and she bore quarters for a far larger crew than an automated tramp needed or could support. Considerations of mass distribution made

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converting that cubic footage into cargo room impractical. Consequently, finding the Captain could take on some of the salient aspects of finding the proverbial football in the asteroid belt.

"Unless he's actually in the Control Room," Fleming mused aloud, putting down his eighth cup of coffee.

"Beg pardon?" said Nandi, who had been absorbing considerable fuel herself. "Who's in the Control Room?"

"The Captain, I hope," Fleming replied, then looked frantically round for the Greenie. It was not in sight. "Or one of the other officers," he finished in a whisper.

"Well, as I understand it, there's only one other officer *up* there," Nandi whispered back, "the Executive Officer."

"My God," gasped Fleming. "You mean they're the whole crew?"

"Well, there's the Chief Engineer, but I think he stays below with his converters and things. And the steward, of course, but we don't know where he is. The rest of the crew goes *clank* when you kick it."

"Well, how many passengers are there?"

"Aside from us, the Colonel and the Greenie are the only ones I've seen. The murdered man makes five."

Fleming had been counting on considerably more allies. He briefly considered stealing the Greenie's gun and blowing his own brains out with it. Being a hero was incredibly hard work.

But there was no help for it—no turning back. Resolutely he stood up, drawing Nandi to her feet. "Let's go," he said tersely, "before the Greenie shows up for breakfast."

They left, began climbing for officer country. Fleming paused when they reached A-Deck, frowning. "Look," he said, "the Captain or the Exec could be in any one of a couple-dozen staterooms—but either of them *might* be up in the Control Room. Why don't you pop up and check while I start searching here? That way we may save some time."

Nandi nodded. "All right, but be careful, my hero."

"My sentiments exactly."

He had tried about nine rooms unsuccessfully before it occurred to him that Nandi was a long time returning. Either she had found one of the officers, or . . . he sped back to the stairshaft, swarmed up three levels to the Control Room, and burst through the hatchway in classic unarmed-combat stance, ready to deal sudden death in any direction.

A mustached, competent-looking man in ship's uniform blinked amiably at him from one of the pilot's couches. "Sorry," he apologized, "I don't dance." He produced a green, odd-shaped bottle: three chambers hooked in parallel to a common spout. "Prepared to

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offer you a shot of Triple Ripple, though."

Fleming shook his head.

"Sure? Great stuff. Can't let the ingredients mix until you're ready to swallow, but when they do . . . oh boy. I'm the Executive Officer, by the way. Name's Exton." He put out his hands.

"Where's Nandi?"

"Never heard of it; must be Capella way. Check the astrogational computer."

"No, dammit. Nandi, your female passenger. Hasn't she been here?"

"Nobody been here, no women for *damn* sure. Nandi? . . . don't believe I recall the lady."

"Then you've never met her," Fleming said positively. "Never mind, the important thing is that she's in deadly danger. Where's the Captain?"

"Aw now, the Captain wouldn't hurt no *passenger*. He's a gentleman."

Fleming gritted his teeth, then counted to ten and told Exton the whole story. The Exec listened attentively, tugging alternately at the Triple Ripple and his mustache. When the youth had finished, he leaned back on the acceleration couch and slapped his thigh. "Old son, that's the craziest story I ever heard. No wonder you don't want any Triple Ripple—it'd just bring you down. Let me tell you one about my Uncle Jed—true story, too."

"Dammit, Exton, I'm telling you the truth. We've got to find Nandi before it's too late—and we've got to have the Captain flash the Patrol, so they can send a cruiser to rendezvous with us." He broke off, distracted by a sudden, indescribable sensation in his loins.

"Well now," drawled the Exec, "Captain Cavendish is something of an independent gent. Take a lot to make him call in the Patrol."

"You've lost sixty percent of your passengers and twenty-five percent of your crew," Fleming barked, tugging inconspicuously at his crotch. "What do you think the Captain would consider serious?"

The Exec blinked, looked thoughtful. "Well, your story certainly deserves checking, young fellow. Let's go below."

"Now you're talking."

"Reckon we'd best go to passenger country first and start checking staterooms."

"No," Fleming said decisively. "This Greenie is smart. We should go all the way down to the Converter Room and work up through the holds to the passenger deck."

"Sounds like a whole lot of work," Exton demurred.

"Listen, dammit, this Greenie snatched Nandi somewhere between B-Deck and here. It's obviously mobile and clever. The only way to nail it is to start at the bottom and work upward until we flush him out. If we let him get behind us we're finished." There was

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a peculiar look on Exton's face, but Fleming was too bemused by the drawing feeling in his groin to notice.

"All right," the Exec said reluctantly, "we search below." he rose, loosening his blaster in its holster. The sight of it reassured Fleming considerably.

"Whatever you do," he said as they left the Control Room, "look natural. We mustn't make the Greenie suspicious if we can help it."

"OK," said the Exec agreeably, and began to sing a duet with himself.

Seeing Fleming's astonishment, he broke off. "Forgot, you don't know. I was born on Harmony, a pleasant little place where we feel that music is the bedrock of true culture. Most of us have had biomod work done on our larynxes, sort of improved on nature. I've got a five-octave range myself, and I can handle up to three voices at once. Handy—gets the women. And I guess it's how come I'm so partial to Triple Ripple, now I think about it."

Fleming puzzled over this as they made their way below. He had heard of biomodification even on the rather provincial planet of his birth, but he had always considered it a rather blasphemous attempt to distort the Creator's intentions. Now, however, he admitted to himself that there were advantages to more versatile vocal cords, at least. Exton was pretty good *a cappella.*

When they reached the Converter Room, the Chief Engineer was nowhere to be found. "Probably sound asleep somewhere, if I know Reilly," chuckled the Exec, but Fleming was filled with dark suspicion. They searched the Power Room thoroughly and found nothing.

"Well," said Fleming at last, "I guess that makes it fifty percent of the crew gone."

"Oh, listen here, young fellow, Reilly's around somewhere. He's got a lonely job, probably off brewing himself some rocket juice someplace or other." They started up the ladder.

"Listen, Exton," Fleming insisted as they reached the cargo level, "I don't think you're taking this whole thing seriously enough. There's a *killer* on board."

"That remains to be proved, son."

"But by the nature of the problem it may be almost impossible to prove before we're dead. *Won't* you call the Patrol?"

"With no evidence to show the Captain? Hah! I'll take my chances with this killer of yours."

"Well, keep your gun handy," grumbled Fleming, disgusted with the Exec's refusal to behave by adventure-story standards. Exton snorted, but drew his blaster. Together they began to search the cargo hold, a huge steel cavern

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piled high with stacked crates and tarpaulin-covered machinery of all sizes and shapes. The lighting was dim, and Fleming imagined crazed Greenies in every pool of shadow, but none materialized. Neither did Reilly. Finally every cranny had been poked into, unsuccessfully, and Exton started to return to the stairshaft.

"Wait," said Fleming suddenly. "I've got an idea. It seems to me that if I wanted to hide on a ship like this, I'd stay right here in the hold."

"But we've looked . . ." Exton began wearily.

"Not in the cargo itself," Fleming broke in. "I can see five crates from here that are large enough to fit the two of us in."

"Now hold on, young fellow," Exton protested. "I'm not about to start breaking open crates of merchandise that ain't mine to look for a killer I'm not sure exists."

"Well, I'm sure," snapped Fleming. Turning to the nearest crate of sufficient size, he slapped its pressure seals. Exton yelped in protest, but it was too late—the top of the crate slid open.

Fleming levered himself up on his elbows, peered down into the crate. "No luck with this one. Full of some kind of white powder."

"There, you see?" said Exton, wiping sweat from his forehead. "Sugar or something."

"No wait!" gasped Fleming, excitement in his voice. "This is no sugar, Exton—it's thionite! Kilos of it."

"No crap?" the Exec said weakly.

"Sure. That lemony odor is unmistakable. Well, I'll be damned. There's more here than meets the eye. *Now* will you call the Patrol?"

"I reckon I'll have to do *something*," said Exton, looking grim.

Very suddenly a dark form detached itself from the shadows, landed on Exton's shoulders and knocked him sprawling to the deck. A gun-butt rose and fell, and Exton gave three cries simultaneously and lay still.

As Fleming dropped to his feet, numb with terror, the attacker rose and covered him with a vicious-looking little handgun. It tempered the relief with which Fleming noted that his assailant was human. "Who . . . who are you?" he stammered.

"Chief Engineer," snarled the other, "as if you didn't know."

"Listen, Reilly, give it up. You'll never get away with this."

"Shaddap and come here. You're going to carry this sleeping beauty right up topside to the lifeboats, and then the two of you are going for a nice little ride. Without an astrogational computer."

Fleming went cold. This sort of thing happened all the time in the adventure stories, but the hero was always prepared with something: a special plan, an unsuspected ally, a concealed weapon. Fleming had none of these; it had never oc-

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curred to him that the Greenie might have human confederates. The fact disgusted him.

Under the unarguable direction of Reilly's gun-barrel, Fleming heaved Exton awkwardly over one shoulder and began climbing. When they reached C-Deck he set the Exec down as gently as he could and began dragging him past the passengers' cabins to the lifeboat locks, noticing with numb indifference that two of the six locks were empty. "Out of shape," he gasped, and Reilly sneered.

When he had dumped Exton's limp and, by now, dusty form inside the first lifeboat in line, number three, he turned to face Reilly, who stood just outside the airlock with his gun leveled at Fleming's midsection.

"Can't we talk this over?" he asked. Reilly smiled, tightened his finger on the firing stud.

Suddenly voices came from behind him, and the Chief Engineer froze. "Hold it right there." "Patrol, put 'em up." "Drop it, Reilly."

At the last voice, Reilly suddenly unfroze again, and his grin returned. "Nice try, Exton, but it won't work. That fancy throat of yours makes you a better ventriloquist than a Denebian Where-Is-It, but you can't fool me. If the Patrol really was behind me, they'd be calling me by my real name—which is *not* Reilly."

Exton sat up, shrugged. "Can't blame a fellow for trying."

"Maybe not," said Reilly, "but I can kill you for it." He broke off as the sound of shod feet on deck-plates came from behind him. "Say, that's pretty good. I didn't know you could imitate sounds too."

"He can't," said Nandi as she brought an oxy-bottle down hard across Reilly's skull.

The Greenie, Nandi explained, had spotted her on her way up to the Control Room and taken a shot at her that barely missed. Fortunately, she was able to elude the monster and hide in number four lifeboat, where she had remained in terror until the noise of Fleming dragging Exton into the neighboring boat had drawn her out.

"You've been very brave, Nandi," Fleming said approvingly as he checked the clip on Reilly's gun. "Well, Exton, now do you believe me?"

"Guess I sort of have to," the Exec drawled. "Wasn't for the young lady here, we'd be trying to astrogate through deep space by eye about now."

"What I don't understand," Fleming mused, "is why the Greenie took Reilly into cahoots with it. There's something going on here I don't understand. Well, anyway, it's past time we notified the Patrol."

"Suppose you're right," Exton agreed.

"Where do we find the Captain?"

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Nandi asked. "He should send the message."

"He usually hangs out on A-Deck," Exton decided. "We'll probably find him in the crew's lounge there, playing whist with the computer."

"OK," said Fleming decisively, tightening his grip on his gun. "Let's go."

The three ascended together cautiously, Fleming in the lead, Exton covering their rear. As they climbed, they conversed in whispers.

"How do you suppose all that thionite you boys found ties in with Carmody's murder?"

"I don't know, Nandi. There are more questions than answers in this case." Fleming was a little short-tempered; the peculiar not-quite-pain in his groin was still troubling him.

"Maybe Reilly, Carmody and the Greenie were in partnership on the thionite," suggested Exton from beneath them.

"Could be," Fleming agreed, pausing to peer cautiously over the hatch-coaming before exposing himself. "Then Carmody tried to doublecross them somehow—the Greenie said something about him trying to keep all that money to himself." He clambered through the hatch and reached down to help Nandi up, looking around for the Greenie.

"But where are all the bodies?" Nandi asked. "You found nothing in the Converter Room or the hold, and it would make no sense to hide them where there are more people around."

"I dunno, maybe the Greenie spaced them all. What do you think, Exton?"

No answer.

"Exton!" Fleming stuck his head down through the hatch and looked around. The Exec was nowhere in sight.

Nandi gasped, began to tremble. Fleming set his jaw grimly and closed the hatch, dogging it as tightly as he could. "Let's go," he rapped, and began climbing again, pulling Nandi after him.

They found the Captain just where Exton had guessed they might, in a lounge on the uppermost of the two crew-levels, engrossed in a card game with a relatively simple-minded recreational computer. He was a patriarchal figure, massive and heavily-bearded, authority obvious in both the set of his broad shoulders and the disrupter that hung at his hip. He rose as the two entered, bowed to Nandi, and raised a shaggy eyebrow at Fleming. "Yes? What can I do for you?"

"You can call the Galactic Patrol," said Fleming, and without preamble launched into his third retelling of the past day's events. The sincerity in his voice was unmistakable, and when he finished the Captain had a dark look on his craggy face.

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"Your story is easily checked, young man," he rumbled. He closed a switch on the wall beside him and said, "Exton. Reilly. Report on the double to A-Deck rec lounge. Hop." His voice seemed to echo in the distance, and Fleming realized he had cut in the command intercom.

They waited for a minute or two with no result. Then the Captain rose to his feet and put his right hand to the butt of his disrupter. His mouth was a tight line and there was thunder in his eye. With his other hand he removed a remote control unit from his tunic, dialed a frequency and said clearly, "Computer: broadcast, this frequency. 'Emergency. Emergency. Interstellar Vessel *This Train,* Captain Cavendish speaking. Killers on board, crew captured or killed. Request Patrol lock onto this carrier and rendezvous at once, repeat at once, prepared for armed resistance. Cavendish out.' Repeat and maintain carrier."

Fleming breathed a sigh of relief. Whatever happened now, the Patrol would be here soon. He began to relax—then stiffened as he realized that the intercom was still on. The Greenie must have heard every word! He waved frantically to get Captain Cavendish's attention and pointed to the wall-switch. Cavendish paled, put down the computer-relay link and slapped the switch open, but the damage was done.

"Look," rapped the Captain, "I've got to get down to the lifeboats and make sure that damned creature doesn't escape before the Patrol arrives. You stay here, barricade the door and don't stick your head out until I knock shave-and-a-haircut. You've got to keep this young lady safe," he put in as Fleming began to object. "I'll be all right—I've had some experience with hijackers before."

Fleming reluctantly agreed. He hated to lose out on potential heroics, but protecting the fair maiden was definitely a duty no hero could dodge. Besides, it was safer.

As soon as the Captain had left, Nandi came into his arms and captured his lips in an urgent, demanding kiss. "Hold me, Fleming," she breathed, "I'm so afraid."

"Don't worry, Nandi," Fleming reassured her with all the bravado he had left. "I'll keep you safe." His arms tightened protectively around her.

"Of course you will, my hero," Nandi said, "Just as you are keeping my jewels safe. Where did you put them, by the way? I've been meaning to ask you since that Reilly almost . . . I mean . . ."

"I understand," he said quickly. "I should have thought of that. They're in my stateroom, under my pillow. Who'd ever . . ." He trailed off. Nandi's hands had begun to wander, and while that confoundingly indefinable sensation

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had not left his groin, Fleming discovered that whatever it was did not interfere with performance. *What the hell,* he was telling himself, when suddenly something caught his eye and made him go rigid from the waist up as well. "My God," he breathed.

"What is it?" asked Nandi, sensing that he was no longer responding.

"That communications relay the Captain used. It's not set for emergency band at all—way off, as far as I can tell. Cavendish must have accidentally dialed the wrong frequency. Good Lord, if I hadn't noticed . . ." He let go of Nandi, picked up the device and reset it, then repeated the Captain's message as best he could remember. "That was too damned close. We would have waited for the Patrol till we were old and gray." He frowned. "I'd better let the Captain know what happened, so he doesn't do something foolish if the Patrol is late in showing up."

He activated the intercom. "Captain Cavendish?" No reply. "Captain, this is Fleming. Come in, please, it's urgent." There was no response at all for a long minute, and then the speaker came alive.

"Mr. Ayniss," came the unmistakable booming voice of the Greenie, "I would advise you not to meddle in criminal matters. They don't concern you."

Fleming jumped a foot in the air, his pulse-rate tripling instantly. Somehow the giant killer had gotten the drop on Cavendish, turned the tables again. The youth made a quick decision, a decision based on pure heroism.

"Wait here," he barked, killing the intercom again, "and don't let *anyone* in. I'm going to do what the Captain failed to do—keep that damned creature here until the authorities arrive. We can't let it get away."

Nandi began to protest, but Fleming ignored her and stepped out into the corridor, gun in hand. He was genuinely terrified, but a cold anger sustained him and steadied his weapon in his inexperienced grasp. He felt partially responsible for the carnage that had resulted from his discovery of the original murder, and he meant to avenge the crew and passengers of *This Train.* The Colonel, the steward, the Exec, the Captain, Nandi, all had been innocent victims, ordinary decent folks attacked without knowing why, given no chance to defend themselves. The murdering alien would pay for its crimes—Fleming intended to see to it. He made his way to the lifeboat locks, his peripheral vision straining to meet itself behind his head.

Unfortunately, it failed in this endeavor. As he approached the lifeboat locks, agony exploded in the back of his skull and extinguished the corridor lights one by one. He never felt the deck smack him in the face.

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The blow had been startling, but he was considerably more surprised to regain consciousness, alive and unharmed, his gun still nearby where he had dropped it. He reclaimed it, rose shakily to his feet and staggered to the locks.

All six lifeboats were gone.

Got away, dammit, thought Fleming. *Probably fired off all the other boats to make itself harder to track.* He was furious, with himself as much as with the Greenie. His only consolation was that the murderer had been careless enough to fail to finish him off. He decided to make sure Nandi was all right, and headed back up to the lounge.

Nandi was not all right. At least, she was missing from the lounge. Fleming knew one timeless moment of pure fury, the frustrated rage of undeniable failure. The Greenie had obviously taken her along as a hostage in case the Patrol caught up with it.

The youth sank down into a chair and buried his head in his hands. He was bitterly sorry that he had ever heard the word *adventure,* and he cursed the nosy curiosity that had precipitated this slaughter.

After a long, black time he began to think again. Numbly, he decided to go below and check whether the Greenie had removed the thionite from the hold. Perhaps it had been in too much of a hurry.

But when he reached the hold, he heard noises from close at hand and melted quietly into the shadows, his gun growing out of his fist.

It was the Greenie, it had to be! How, Fleming couldn't imagine and didn't care; the song of blood rushing in his temples had a one-word libretto: vengeance. He smiled grimly to himself and clenched his gun tightly, peering with infinite caution around the fender of a half-track farming vehicle.

The Greenie was just resetting the seals on the opened crate of thionite, an ominous expression on its face. Fleming took careful aim at the massive head, but before he could fire, the alien strode rapidly to the stairshaft and climbed above. Fleming slipped from concealment and followed it, reaching the shaft in time to see the Greenie step off two levels above, on C-Deck.

Narrowing his eyes, Fleming ascended noiselessly to C-Deck, just quickly enough to spot the killer entering Carmody's stateroom, the scene of the original murder. He waited, hidden by the hatch cover, until the creature had exited and turned a corner. Fleming padded silently after it. As he passed Carmody's room, he glanced in, and was not even mildly surprised to discover that the corpse was missing. It figured. The Greenie was housecleaning.

Fleming intended to do a little housecleaning of his own.

He eased around the corner with care, but the corridor was deserted. The nameplate on the third door

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he came to read, "Rax Ch'loom, Sirius II." Jackpot!

Fleming took hold of the door-latch, paused for a long moment to bid good-bye to his adolescence, then yanked open the door. The first thing he saw was the Greenie, surprised in the act of changing clothes, literally caught with its pants down. The second thing he saw was Carmody's body on the bed, neatly trussed up with nylon cord. A part of him wondered why the Greenie would tie up a corpse, but the majority of him simply didn't give a damn.

"This is for Nandi, you bastard," he said clearly, and aimed for the trifurcate nose.

And then something struck him between the shoulder-blades, smashing him to the deck. His chin hit hard enough to drive a wedge of black ice up into his brain, where it melted, turning everything to inky dark.

"Crap," Fleming said as consciousness returned.

"You bet, old son," said a pleasant baritone. "Several fans-full of the stuff, in fact."

Fleming looked up, startled. A smiling lieutenant of the Galactic Patrol knelt over him, smelling salts in one hand and a vortex disrupter in the other.

"Did you get him?" Fleming cried. "Did you get the Greenie?"

"Ch'loom? Hell no, Mr. Ayniss, but we got damned near everybody else. God-damnedest thing I ever saw—a freighter torching along practically empty, and six lifeboats full of crooks heading away from it in different directions like the Big Bang all over again. We picked 'em all up OK, but what I'd like to know is what put the wind up all of them? Their stories don't make much sense when you put them all together."

Fleming shook his head confusedly, allowed the Patrolman to help him to his feet. "I don't understand," he said weakly. "Lifeboats full of crooks?"

"Sure," said the Patrolman, holstering his sidearm. "First one in line was a Colonel Underwear-Waist or some such, claimed you were the first sucker in ten standard years to catch him stacking the cards."

"Huh?" gasped Fleming, thunderstruck.

"Yep. Old-time card-sharp, according to our computer records. Been working the tramps for years, ever since the regular lines got on to him. How'd you tumble to him, Ayniss?"

"Uh," Fleming explained. He tried to recall the exact wording of the message he had slipped into "Captain Galaxy Meets His Match" a hundred years ago. "Who was next?"

"Next was the ship's steward, chap named Blog. Says you found out he was rifling staterooms and threatened to tip off the Captain,

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so he lit out as soon as he could. We found a lot of boodle with him—guess you've got a reward or two coming. Then there was an engineer who claimed his name was Reilly, but he turned out to be a guy named Foster, wanted for murder over on Armageddon. Had his fingerprints changed, of course, but he couldn't afford biomod work on his retinas. According to him, he heard you and the Executive Officer talking, realized you were on to him and stuck the two of you up. Then, he claims, somebody else sapped him, and he woke up alone in number three lifeboat, which he did not hesitate to use.

"But the next customer was the Exec himself, Exton is it? And under questioning he broke down and admitted smuggling thionite on board to sell at Forced Landing. We found the thionite just where he said it would be. Say, did you know he's got a modified voicebox? Cursed you out in three-part harmony.

"But the strangest of the bunch was Captain Cavendish himself. He was really surprised to see us—kept insisting that he'd called us himself and he was *sure* he'd used the wrong frequency, which doesn't seem to make much sense. But he was so flabbergasted he slipped up and mentioned what frequency he *had* used. Just for fun we broadcast, 'All clear, come ahead,' on that frequency, and a whole gang of pirates walked into the surprise of their life. Apparently Cavendish was in cahoots with them on some kind of insurance fraud scheme, figured to let them rob the ship without a fight. We've got 'em all, and we didn't lose a man."

"What about Nandi?" Fleming asked groggily. "She has to be honest—she gave me a fortune in jewels for safekeeping."

"Nandi *Tyson*—'honest'? Say, we've been looking for her for years, ever since she started passing out counterfeit Carezza fire-diamonds in the outworlds. She was the last one we picked up—she had those diamonds with her, by the way—and boy was she ever mad at you."

Fleming's head spun. "Does this mean that the diamonds are worthless?" he asked.

The Patrol lieutenant had studied classical humor in college, but even as the phrase "Ayniss and Nandi," exploded hilariously in his brain, he felt a flash of compassion for the crestfallen youth and kept a straight face.

"Put it this way, Ayniss," he said gravely. "Yes."

"But—but what about the Greenie? Didn't you get him too? He's the one that started all this madness."

"No, my friend," came a booming voice from the doorway, "I am afraid you did that all by yourself."

Fleming whirled. The Greenie stood there smiling, a gun at its hip, a Patrol officer at its side. "Get

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it," Fleming screamed at the lieutenant, "It's a murderer."

"Ch'loom a murderer?" the officer said dubiously. "That's a little hard to believe."

"I tell you I saw it," gibbered Fleming. "The damned thing killed a man named Carmody."

The Greenie's smile deepened, exposing more fang. It stepped aside, to reveal Carmody standing behind it, demonstrably alive. Their wrists were handcuffed together. Fleming's mouth opened, and stayed that way.

"Allow me to introduce Rax Ch'loom, Official Equalizer of Carson's World," said the lieutenant. "My name's Hornsby, by the way, pleased to meet you."

"Equalizer?" mumbled Fleming dazedly.

"Sure," Hornsby replied cheerfully. "Rax showed up on Carson's World about thirty years back and commenced stealing from the rich and giving to the poor. The idea caught on so well they institutionalized him—gave him legal immunity from prosecution, quasigovernmental status, subsidies, the works."

"What did the rich do?" exploded Fleming.

"Squawked like hell," Rax grinned. "There wasn't much else they could do."

"But don't the rich hold the political power?" asked Fleming, stunned.

"Hey," Rax replied, "we got de-

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mocracy. *Lots* more poor people than rich people on Carson's World."

"Sounds like a crazy place to me," Fleming snapped, his confusion turning to unreasonable irritation.

"Oh, I dunno," Hornsby intervened. "You get hungry, you go see Rax. You start hogging, Rax rips you off. Sounds pretty comfortable to me."

"Suppose you rob a rich man, and for want of capital he's utterly ruined the next day?"

"You get hungry, you go see Rax."

"But there's more to life than food."

"Hey listen, Rax don't steal no women . . ."

"Other things."

"Like what?"

"Carmody here thought he could take thirty thousand credits out of circulation," Rax boomed contentedly. "Not a chance." Carmody snarled impotently.

"But I felt his wrist," Fleming objected feebly. "It was cold."

". . . as a corpse's wouldn't have been for at least an hour," Rax pointed out. "I put him in a cryonic stasis for my own convenience, and spent the whole rest of the voyage trying to figure out what in the name of the seven bloody devils of Old Terra you were doing."

Fleming gave up, began shaking his head. "Then it's all over?" he asked resignedly.

"Er . . . not quite, Ayniss," Hornsby said with curious reluctance. "There's one more little matter. Did you and the Tyson woman . . .? I mean, did she . . .? Did you . . .?"

"Well, yes," Fleming admitted, remembering that he did have at least one thing to be proud of. "She's from Do It, you know."

"You knew that and still let her?" gasped Hornsby, his jaw dropping.

"Hell, yes. She said Do It was based on total sexual freedom, so as to eliminate tension and frustration. It sounded like a good idea to me."

"It sounds like a good idea to me too, but that's not what Do It is like. It's a world full of fanatical feminists, not hedonists. All the women have had the same biomod work performed on them."

"What kind?" Fleming asked, feeling that strange and indescribable feeling in his crotch again.

"Uh . . . well, you may as well know. It has to do with modifying the ovum, giving it the mobility and the seeking instinct of a sperm cell, with some of the parasitic characteristics of a tapeworm. Only a psychotic female-supremacist could have conceived of it." He broke off, embarrassed.

"Well?" said Fleming. "*Tell* me, dammit."

"I'm afraid, Mr. Ayniss," said the Greenie with genuine compassion, "that you are pregnant." ■

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Technology can perform feats
that are seemingly miraculous—
within the limits of physics.

JOE HALDEMAN

THIS BEST OF ALL POSSIBLE WORLDS

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"Quick and dirty." I was looking at my platoon sergeant, Santesteban, but talking to myself. And anybody else who was listening.

"Yeah," he said. "Gotta do it in the first coupla minutes or we're screwed tight." He was matter-of-fact, laconic. Drugged.

Private Collins came up with Halliday. They were holding hands unselfconsciously. "Lieutenant Mandella?" Her voice broke a little. "Can we have just a minute?"

"One minute," I said, too abruptly. "We have to leave in five. I'm sorry."

Hard to watch those two together, now. Neither one had any combat experience. But they knew what everybody did; how slim their chances were of ever being together again. They slumped in a corner and mumbled words and traded mechanical caresses, no passion or even comfort. Collins' eyes shone but she wasn't weeping. Halliday just looked grim, numb. She was normally by far the prettier of the two, but the sparkle had gone out of her and left a well-formed dull shell.

I'd gotten used to open female homosex in the months since we'd left Earth. Even stopped resenting the loss of potential partners. The men together still gave me a chill, though.

I stripped and backed into the clamshelled suit. The new ones were a hell of a lot more complicated, with all the new biometrics and trauma maintenance. But well worth the trouble of hooking up, in case you got blown apart just a little bit. Go home to a comfortable pension with heroic prosthesis. And they were even talking about the possibility of regeneration, at least for missing arms and legs. Better get it soon, before Heaven filled up with fractional people. Heaven was the new hospital/rest-and-recreation planet.

I finished the set-up sequence and the suit closed by itself. Gritted my teeth against the pain that never came, when the internal sensors and fluid tubes poked into your body. Conditioned neural bypass, so you felt only a slight puzzling dislocation. Rather than the death of a thousand cuts.

Collins and Halliday were getting into their suits now and the other dozen were almost set, so I stepped over to the third platoon's staging area. Say good-bye again to Marygay.

She was suited and heading my way. We touched helmets instead of using the radio; privacy.

"Feeling OK, honey?"

"All right," she said. "Took my pill."

"Yeah, happy times." I'd taken mine too, supposed to make you feel optimistic without interfering with your sense of judgment. So I knew most of us would probably die, but I didn't feel too bad about it. "Sack with me tonight?"

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"If we're both here," she said neutrally. "Have to take a pill for that, too." She tried to laugh. "Sleep, I mean. How're the new people taking it? You have ten?"

"Ten, yeah, they're OK. Doped up, quarter-dose."

"I did that, too; try to keep them loose."

In fact, Santesteban was the only other combat veteran in my platoon; the four corporals had been in UNEF for a while, but had never fought.

The speaker in my cheekbone crackled and Commander Cortez said, "Two minutes. Get your people lined up."

We had our good-bye and I went back to check my flock. Everybody seemed to have gotten suited up without any problems, so I put them on line. We waited for what seemed like a long time.

"All right, load 'em up." With the word *up,* the bay door in front of me opened—the staging area having already been bled of air—and I led my men and women through to the assault ship.

These new ships were ugly as hell. Just an open framework with clamps to hold you in place; swiveled lasers fore and aft, small tachyon power plants below the lasers. Everything automated; the machine would land us as quickly as possible and then zip off to harass the enemy. It was a one-use, throwaway drone. The vehicle that would come pick us up if we survived was cradled next to it, much prettier.

We clamped in and the assault ship cast off from the *Sangre y Victoria* with twin spurts from the yaw jets. Then the voice of the machine gave us a short countdown and we sped off at four G's acceleration, straight down.

The planet, which we hadn't bothered to name, was a chunk of black rock without any normal star close enough to give it heat. At first it was visible only by the absence of stars where its bulk cut off their light, but as we dropped closer we could see subtle variations in the blackness of its surface. We were coming down on the hemisphere opposite the Taurans' outpost.

Our recon had shown that their camp sat in the middle of a flat lava plain several hundred kilometers in diameter. It was pretty primitive compared to other Tauran bases UNEF had encountered, but there wouldn't be any sneaking up on it. We were going to careen over the horizon some fifteen klicks from the place, four ships converging simultaneously from different directions, all of us decelerating like mad, hopefully to drop right in their laps and come up shooting. There would be nothing to hide behind.

I wasn't worried, of course. Abstractly, I wished I hadn't taken the pill.

We leveled off about a kilometer

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from the surface and sped along, much faster than the rock's escape velocity, constantly correcting to keep from flying away. The surface rolled below us in a dark gray blur; we shed a little light from the pseudo-Cerenkov glow made by our tachyon exhaust, scooting away from our reality into its own.

The ungainly contraption skimmed and jumped along for some ten minutes, then suddenly the front jet glowed and we were snapped forward inside our suits, eyeballs trying to escape from their sockets in the rapid deceleration.

"Prepare for ejection," the machine's female-mechanical voice said. "Five, four . . ."

The ship's lasers started firing, millisecond flashes freezing the land below in jerky stroboscopic motion. It was a twisted, pock-marked jumble of fissures and random black rocks, a few meters below our feet. We were dropping, slowing.

"Three—" It never got any farther. There was a too-bright flash and I saw the horizon drop away as the ship's tail pitched down—then clipped the ground and we were rolling, horribly; pieces of people and ship scattering. Then we slid pinwheeling to a bumpy halt and I tried to pull free but my leg was pinned under the ship's bulk: excruciating pain and a dry crunch as the girder crushed my leg; shrill whistle of air escaping my breached suit, then the trauma maintenance turned on *snick* and more pain, then no pain and I was rolling free, short stump of a leg trailing blood that froze shiny black on the dull black rock. I tasted brass and a red haze closed everything out, then deepened to the brown of river clay, then loam and I passed out, with the pill thinking *this is not so bad.*

The suit is set up to save as much of your body as possible. If you lose part of an arm or a leg, one of sixteen razor-sharp irises closes around your limb with the force of a hydraulic press, snipping it off neatly and sealing the suit before you can die of explosive decompression. Then "trauma maintenance" cauterizes the stump, replaces lost blood, and fills you full of happyjuice and No-shock. So you will either die happy or, if your comrades go on to win the battle, eventually be carried back up to the ship's aid station.

We'd won that round, while I slept swaddled in dark cotton. So I woke up in the infirmary. It was crowded. I was in the middle of a long row of cots, each one holding someone who had been three-fourths (or less) saved by his suit's trauma maintenance feature. We were being ignored by the ship's two doctors, who stood in bright light at operating tables, absorbed in blood rituals. I watched them for a long time. Squinting into the bright light, the blood on their

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green tunics could have been grease, the swathed bodies, odd soft machines that they were fixing. But the machines would cry out in their sleep and the mechanics muttered reassurance while they plied their greasy tools. I watched and slept and woke up in different places.

Finally I woke up in a regular bay. I was strapped down and being fed through a tube, biosensor electrodes attached here and there, but no medics around. The only other person in the little room was Marygay, sleeping on the bunk next to me. Her right arm was amputated just above the elbow.

I didn't wake her up; just looked at her for a long time and tried to sort out my feelings. Tried to filter out the effect of the mood drugs. Looking at her stump, I could feel neither empathy nor revulsion. I tried to force one reaction, and then the other, but nothing real happened. It was as if she had always been that way. Was it drugs, conditioning, love? Have to wait, to see.

Her eyes opened suddenly and I knew she had been awake for some time; had been giving me time to think. "Hello, broken toy," she said.

"How—how do you feel?" Bright question.

She put a finger to her lips and kissed it, a familiar gesture, reflection. "Stupid, numb. Glad not to be a soldier any more." She smiled. "Did they tell you? We're going to Heaven."

"No. I knew it would be either there or Earth."

"Heaven will be better." Anything would. Marygay and I had seen Earth together, last "furlough." The war had changed it very much for the worse. "I wish we were there now."

"How long?" I asked. "How long before we get there?"

She rolled over and looked at the ceiling. "No telling. You haven't talked to anybody?"

"Just woke up."

"There's a new directive they didn't bother to tell us about. Before. The *Sangre y Victoria* got orders for four missions. We have to keep on fighting until we've done all four. Or until we've sustained so many casualties that it wouldn't be practical to go on."

"How many is that?"

"I wonder. We lost a good third already. But we're headed for Aleph-7. Panty raid." New slang term for the type of operation where our main objective was to gather Tauran artifacts, and prisoners if possible. I tried to find out where the term came from, but the one explanation I got was really idiotic.

One knock on the door and Dr. Foster barged in. He fluttered his hands. "Still in separate *beds?* Marygay, I thought you were more recovered than that." Foster was all right. A flaming mariposa, but he

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had an amused tolerance for heterosexuality.

He examined Marygay's stump, and then mine. He stuck thermometers in our mouths so we couldn't talk. When he spoke, he was serious and blunt.

"I'm not going to sugarcoat anything for you. You're both on happyjuice up to your ears, and the loss you've sustained isn't going to bother you until I take you off the stuff. For my own convenience I'm keeping you drugged until you get to Heaven. I have twenty-one amputees to take care of. We can't handle twenty-one psychiatric cases.

"Enjoy your peace of mind while you still have it. You two especially, since you'll probably want to stay together. The prosthetics you get on Heaven will work just fine, but every time you look at his mechanical leg or you look at her arm, you're going to think of how lucky the other one is. You're going to constantly trigger memories of pain and loss for each other . . . you may be at each other's throats in a week. Or you may share a sullen kind of love for the rest of your lives.

"Or you may be able to transcend it. Give each other strength. Just don't kid yourselves if it doesn't work out."

He checked the readout on each thermometer and made a notation in his notebook. "Doctor knows best, even if he is a little weird by your own old-fashioned standards. Keep it in mind." He took the thermometer out of my mouth and gave me a little pat on the shoulder. Impartially, he did the same to Marygay. At the door, he said, "We've got collapsar insertion in about six hours. One of the nurses will take you to the tanks."

We went into the tanks—so much more comfortable and safe than the old individual acceleration shells—and dropped into the Tet-2 collapsar field already starting the crazy fifty-G evasive maneuvers that would protect us from enemy cruisers when we popped out by Aleph-7, a microsecond later.

Predictably, the Aleph-7 campaign was a dismal failure, and we limped away from it with a two-campaign total of fifty-four dead and thirty-nine cripples bound for Heaven. Only twelve soldiers were still able to fight, but they weren't exactly straining at the leash.

It took three collapsar jumps to get to Heaven. No ship ever went there directly from a battle, even though the delay sometimes cost extra lives. It was the one place besides Earth that the Taurans could not be allowed to find.

Heaven was a lovely, unspoiled Earth-like world; what Earth might have been like if men had treated her with compassion instead of lust. Virgin forests, white beaches, pristine deserts. The few dozen cities there either blended perfectly with the environment (one was totally

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underground) or were brazen statements of human ingenuity: Oceanus, in a coral reef with six fathoms of water over its transparent roof; Boreas, perched on a sheared-off mountaintop in the polar wasteland; and the fabulous Skye, a huge resort city that floated from continent to continent on the trade winds.

We landed, as everyone does, at the jungle city Threshold. Three-fourths hospital, it's by far the planet's largest city, but you couldn't tell that from the air, flying down from orbit. The only sign of civilization was a short runway that suddenly appeared, a small white patch dwarfed to insignificance by the stately rain forest that crowded in from the east and an immense ocean that dominated the other horizon.

Once under the arboreal cover, the city was very much in evidence. Low buildings of native stone and wood rested among ten-meter-thick tree trunks. They were connected by unobtrusive stone paths, with one wide promenade meandering off to the beach. Sunlight filtered down in patches and the air held a mixture of forest sweetness and salt tang.

I later learned that the city sprawled out over two hundred square kilometers, that you could take a subway to anywhere that was too far to walk. The ecology of Threshold was very carefully balanced and maintained so as to resemble the jungle outside, with all the dangerous and uncomfortable elements eliminated. A powerful pressor field kept out large predators and such insect life as was not necessary for the health of the plants inside.

We walked, limped and rolled into the nearest building, which was the hospital's reception area. The rest of the hospital was underneath, thirty subterranean stories. Each person was examined and assigned his own room; I tried to get a double with Marygay, but they weren't set up for that.

"Earth-year" was 2189. So I was 215 years old, God, look at that old codger. Somebody pass the hat—no, not necessary. The doctor who examined me said that my accumulated pay would be transferred from Earth to Heaven. With compound interest, I was just shy of being a billionaire. He remarked that I'd find lots of ways to spend my billion, on Heaven.

They took the most severely wounded first, so it was several days before I went into surgery. Afterwards, I woke up in my room and found that they had grafted a prosthesis onto my stump, an articulated structure of shiny metal that to my untrained eye looked exactly like the skeleton of a leg and foot. It looked creepy as hell, lying there in a transparent bag of fluid, wires running out of it to a machine at the end of the bed.

An aide came in. "How you

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feelin', sir?" I almost told him to forget the "sir" crap, I was out of the army and staying out this time. But it might be nice for the guy to keep feeling that I outranked him.

"I don't know. Hurts a little."

"Gonna hurt like a sonuvabitch. Wait'll the nerves start to grow."

"Nerves?"

"Sure." He was fiddling with the machine, reading dials on the other side. "How you gonna have a leg without nerves? It'd just sit there."

"Nerves? Like regular nerves? You mean I can just think 'move' and the thing moves?"

"'Course you can." He looked at me quizzically, then went back to his adjustments.

What a wonder. "Prosthetics has sure come a long way."

"Pross-what-ics?"

"You know, artificial—"

"*Oh* yeah, like in books. Wooden legs, hooks and stuff."

How'd he ever get a job? "Yeah, prosthetics. Like this thing on the end of my stump."

"Look, sir." He set down the clipboard he'd been scribbling on. "You've been away a long time. That's gonna be a leg, just like the other leg except it can't break."

"They do it with arms, too?"

"Sure. Any limb." He went back to his writing. "Livers, kidneys, stomachs, all kinds of things. Still working on hearts and lungs, have to use mechanical substitutes."

"Fantastic." Marygay would be whole again, too.

He shrugged. "Guess so. They've been doing it since before I was born. How old are you, sir?"

I told him, and he whistled, "God-*damn*. You musta been in it from the beginning." His accent was very strange. All the words were right but all the sounds were wrong.

"Yeah, I was in the Epsilon attack. Aleph-null." They'd started naming collapsars after letters of the Hebrew alphabet, in order of discovery; then ran out of letters when the damn things started cropping up all over the place. So they added numbers to the letters; last I heard, they were up to Yod-42.

"Wow, ancient history. What was it like back then?"

"I don't know. Less crowded, nicer. Went back to Earth a year ago—hell, a century ago. Depends on how you look at it. It was so bad I re-enlisted, you know? Bunch of zombies. No offense."

He shrugged. "Never been there, myself. People who come from there seem to miss it. Maybe it got better."

"What, you were born on another planet? Heaven?" No wonder I couldn't place his accent.

"Born, raised and drafted." He put the pen back in his pocket and folded the clipboard up to a wallet-sized package. "Yes, sir. Third-generation angel. Best damned planet in all UNEF." He spelled it out; didn't say "you-neff" the way I'd always heard it.

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"Look, I've gotta run, Lieutenant. Two other monitors to check, this hour." He backed out the door. "You need anything, there's a buzzer on the table there."

Third-generation angel. His grandparents came from Earth, probably when I was a young punk of a hundred. I wondered how many other worlds they'd colonized while my back was turned. Lose an arm, grow a new one?

It was going to be good to settle down and live a whole year for every year that went by.

The guy wasn't kidding about the pain. And it wasn't just the new leg, though that hurt like boiling oil. For the new tissue to "take," they'd had to subvert my body's resistance to alien cells; cancer broke out in a half-dozen places, and had to be treated separately, painfully.

I was feeling pretty used up, but it was still kind of fascinating to watch the leg grow. White threads turned into blood vessels and nerves; first hanging a little slack, then moving into place as the musculature grew up around the metal bone.

I got used to seeing it grow, so the sight never repelled me. But when Marygay came to visit, it was a jolt—she was ambulatory before the skin on her new arm had started to grow; looked like a walking anatomy demonstration. I got over the shock, though, and she eventually came in for a few hours every day, to play games or trade gossip or just sit and read, her arm slowly growing inside the plastic cast.

I'd had skin for a week before they uncased the new leg and trundled the machine away. It was ugly as hell, hairless and dead white, stiff as a metal rod. But it worked, after a fashion. I could stand up and shuffle along.

They transferred me to orthopedics, for "range and motion repatterning"—a fancy name for slow torture. They strap you into a machine that bends both the old and new legs simultaneously. The new one resists.

Marygay was in a nearby section, having her arm twisted methodically. It must have been even worse on her; she looked gray and haggard every afternoon, when we met to go upstairs and sunbathe in the broken shade.

As the days went by, the therapy became less like torture and more like strenuous exercise. We both began swimming for an hour or so every clear day, in the calm, pressor-guarded water off the beach. I still limped on land, but in the water I could get around pretty well.

The only real excitement we had on Heaven—excitement to our combat-blunted sensibilities—was in that carefully-guarded water.

They have to turn off the pressor field for a split second every time a

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ship lands; otherwise it would just ricochet off over the ocean. Every now and then an animal slips in, but the really dangerous land animals are too slow to get through. Not so in the sea.

The undisputed master of Heaven's oceans is an ugly customer that the angels, in a fit of originality, named the "shark." It could eat a stack of Earth sharks for breakfast, though.

The one that got in was an average-sized white shark, who had been bumping around the edge of the pressor field for days, tormented by all that protein splashing around inside. Fortunately, there's a warning siren two minutes before the pressor is shut down, so nobody was in the water when he came streaking through. And streak through he did; almost beaching himself in the fury of his fruitless attack.

He was twelve meters of flexible muscle with a razor-sharp tail at one end and a collection of arm-length fangs at the other. His eyes, big yellow globes, were set on stalks more than a meter out from his head. His mouth was so wide that, open, a man could comfortably stand in it. Make an impressive photo for his heirs.

They couldn't just turn off the pressor field and wait for the thing to swim away. So the Recreation Committee organized a hunting party.

I wasn't too enthusiastic about offering myself up as an hors d'oeuvre to a giant fish, but Marygay had spearfished a lot as a kid, growing up in Florida, and was really excited by the prospect. I went along with the gag when I found out how they were doing it; seemed safe enough.

These "sharks" supposedly never attack people in boats. Two people who had more faith in fishermen's stories than I had, went out to the edge of the pressor field in a rowboat, armed only with a side of beef. They kicked the meat overboard and the shark was there in a flash.

This was the cue for us to step in and have our fun. There were twenty-three of us fools waiting on the beach with flippers, masks, breathers and one spear each. The spears were pretty formidable, though, jet-propelled and with high-explosive heads.

We splashed in and swam in phalanx, underwater, toward the feeding creature. When it saw us at first, it didn't attack. First it tried to hide its meal, presumably so that some of us wouldn't be able to sneak around and munch on it while the shark was dealing with the others. But every time he tried for the deep water, he'd bump into the pressor field. He was obviously getting very pissed off.

Finally, he just let go of the beef, whipped around and charged. Great sport. He was the size of your finger one second, way down

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there at the other end of the field, then suddenly as big as the guy next to you and closing fast.

Maybe ten of the spears hit him—mine didn't—and they tore him to shreds. But even after an expert, or lucky, brain shot that took off the top of his head and one eye, even with half his flesh and entrails scattered in a bloody path behind him, he slammed into our line and clamped his jaws around a woman, grinding off both of her legs before it occurred to him to die.

We carried her, barely alive, back to the beach where an ambulance floater was waiting. They poured her full of blood surrogate and No-shock and rushed her to the hospital, where she survived to eventually go through the agony of growing new legs. I decided that I would leave the hunting of fish to other fish.

Most of our stay at Threshold, once the therapy became bearable, was pleasant enough. No military discipline, lots of reading and things to potter around with. But there was a pall over it, since it was obvious that we weren't out of the Army: just pieces of broken equipment that they were fixing up to throw back into the fray. Marygay and I each had another three years to serve in our lieutenancies.

But we did have six months of rest and recreation coming, once our new limbs were pronounced in good working order. Marygay was released two days before I was, but waited around for me.

My back pay came to $892,746,012. Not in the form of bales of currency, fortunately; on Heaven they used an electronic credit exchange, so I carried my fortune around in a little machine with a digital readout. To buy something you just punched in the vendor's credit number and the amount of purchase; the sum was automatically shuffled from your account to his. The machine was the size of a slender wallet and coded to your thumbprint.

Heaven's economy was governed by the continual presence of thousands of resting, recreating millionaire soldiers. A modest snack would cost a hundred bucks; a room for a night at least ten times that. Since UNEF built and owned Heaven, this runaway inflation was pretty transparently a simple way of getting our accumulated pay back into the economic mainstream.

We had fun, desperate fun. We rented a flyer and camping gear and went off for weeks, exploring the planet. There were icy rivers to swim and lush jungles to crawl through; meadows and mountains and polar wastes and deserts.

We could be totally protected from the environment by adjusting our individual pressor fields—sleep naked in a blizzard—or we could take nature straight. At Marygay's suggestion, the last thing we did

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before coming back to civilization was to climb a pinnacle in the desert, fasting for several days to heighten our sensibilities (or warp our perceptions, I'm still not sure), and sit back-to-back contemplating the languid flux of life in the searing heat.

Then off to the fleshpots. We toured every city on the planet, and each had its own particular charm, but we finally returned to Skye to spend the rest of our leave time.

The rest of the planet was bargain-basement compared to Skye. In the four months we were using the airborne pleasure dome as our home base, Marygay and I each went through a good half-billion dollars. We gambled—sometimes losing a million dollars or more in a night—ate and drank the finest the planet had to offer, and sampled every service and product that wasn't too bizarre for our admittedly archaic tastes. We each had a personal servant, whose salary was rather more than that of a major-general.

Desperate fun, as I said. Unless the war changed radically, our chances of surviving the next three years were microscopic. We were remarkably healthy victims of a terminal disease, trying to cram a lifetime of sensation into half of a year.

We did have the consolation, not small, that however short the remainder of our lives would be, we would at least be together. For some reason it never occurred to me that even that could be taken from us.

We were enjoying a light lunch in the transparent "first floor" of Skye, watching the ocean glide by underneath us, when a messenger bustled in and gave us two envelopes: our orders.

Marygay had been bumped to captain, and I to submajor, on the basis of our military records and tests we had taken at Threshold. I was a company commander and she was a company's executive officer.

But they weren't the same company.

She was going to muster with a new company being formed right here, on Heaven. I was going back to Stargate for "indoctrination and education" before taking command.

For a long time we couldn't say anything. "I'm going to protest," I said, finally, weakly. "They can't make me a commander. Into a commander."

She was still struck dumb. This was not just a separation. Even if the war was over, and we left for Earth only a few minutes apart, in different ships, the geometry of the collapsar jump would pile up years between us. When the second one arrived on Earth, his partner would probably be a half-century older; more probably dead.

We sat there for some time, not touching the exquisite food, ignor-

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ing the beauty around and beneath us, only conscious of each other and the two sheets of paper that separated us with a gulf as wide and real as death.

We went back to Threshold. I protested but my arguments were shrugged off. I tried to get Marygay assigned to my company, as my exec. They said my personnel had all been allotted. I pointed out that most of them probably hadn't even been born yet. Nevertheless, allotted, they said. It would be almost a century, I said, before I even get to Stargate. They replied that Strike Force Command *plans* in terms of centuries.

Not in terms of people.

We had a day and a night together. The less said about that, the better. It wasn't just losing a lover. Marygay and I were each other's only link to real life, the Earth of the 1980's and 90's. Not the perverse grotesquerie we were supposedly fighting to preserve. When her shuttle took off it was like a casket rattling down into a grave.

I commandeered computer time and found out the orbital elements of her ship and its departure time; found out I could watch her leave from "our" desert.

I landed on the pinnacle where we had starved together and, a few hours before dawn, watched a new star appear over the western horizon, flare to brilliance and fade as it moved away, becoming just another star, then a dim star, and then nothing. I walked to the edge and looked down the sheer rock face to the dim frozen rippling of dunes half a kilometer below. I sat with my feet dangling over the edge, thinking nothing, until the sun's oblique rays illuminated the dunes in a soft, tempting chiaroscuro of low relief. Twice I shifted my weight as if to jump. When I didn't, it was not for fear of pain or loss. The pain would only be a bright spark and the loss would only be the Army's. And it would be their ultimate victory over me, in a way—having ruled my life for so long, to force an end to it.

That much, I owed to the enemy. ■

The AnLab is your chance to tell us which stories you like best, and thereby reward your favorite authors with solid cash. It works this way: send us a card or letter with a list of the stories in each month's issue, ranked in the order in which you preferred them. We average the votes and publish the results here. (For the most recent results, see the Analytical Laboratory listing on the contents page, under "Reader's Departments.") The story that comes closest to having an average of 1.00 (which would mean it received a first-place vote from everyone voting) earns its author an extra one cent a word: $100, in the case of a 10,000-word novelette. The story in second place receives a half-cent extra per word. Send your vote to Analog, Condé Nast Building, 350 Madison Avenue, New York City 10017.

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UNLIMITED WARFARE

The horrors of war
are not limited to guns and bombs.
HAYFORD PEIRCE

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The muted tones of Big Ben tolled mournfully through the late afternoon fog. Not far from St.-James' Barracks three men warmed themselves before an Adams fireplace.

"A scone?" inquired the Permanent Secretary.

"Waistline, you know," muttered the Minister, and served himself a cucumber sandwich. He waved the silver teapot invitingly.

"Terribly barbarian of me, really," said Colonel Christie, "but I'd much prefer a glass of that quite excellent sherry."

The Permanent Secretary raised a deprecatory eyebrow, but covertly. Colonel Christie was not a man who worked easily or effectively under direct orders. His interest must be aroused, his flair engaged, his methods thereafter unquestioned.

The Permanent Secretary sighed inaudibly. It was all very difficult. His master, the Minister, was a politician, adroit in the use of the elegant double-cross, the subtle treachery, the facile disavowal. Easy enough for him to wash his hands afterwards. But he himself was a civil servant, with a lifetime's predilection for agenda, minutes, memoranda, position papers, the Word committed to Paper. And of course, whenever Colonel Christie was involved, none of that was remotely possible. Very difficult indeed.

The Minister was staring into the flames and talking. Rather inconsequentially, it seemed. Three government officials, gentlemen all, taking their tea, making small talk.

Colonel Christie listened very closely indeed to his Minister's insubstantial chatter. It was his job to listen, and out of it would presently emerge, in carefully-guarded circumlocutions to be sure, an indication of what the current complication might be, a hint—but only a hint—in what direction the solution might lie.

They were orders, of course, all very tenuous and spectral, but orders nevertheless. And if a brick were dropped, Christie would carry the can. Misplaced zeal, a subordinate's unwarranted . . . He smiled grimly. This way, at least, the initiative was generally left to him. Afterwards, no one questioned success.

". . . after that man de Gaulle, naturally one hoped for an amelioration of the situation . . . completely shameless . . . trying to buy our way into the Common Market by subscribing to that preposterous *Concorde* project . . . utter blackmail . . . under Pompidou hardly any better . . . open subsidization of the French farmer . . . staggering inflation of our food prices . . . no unity whatsoever . . . the goal of a United Europe smashed, perhaps irreparably . . . *no house spirit* . . . they're simply *not team players.*" Colonel Christie frowned. The Minister was being unwontedly lucid. He must be very troubled indeed.

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". . . this new government, even more hopeless . . . pride, gentlemen, overweening pride, pure and simple . . . no proper respect and cooperation . . . during the days of the Marshall Plan . . . neither the inclination nor the means to play the international gadfly . . . a quite second-rate power basically . . . must be made to realize . . . can't expect them perhaps to come hat in hand, *but* . . ." He waved an arm vaguely, encompassing in a gesture the vast realm of the possible, then rose briskly. "You agree, Jenkins?"

"Up to a point, Sir William, up to a point."

"Splendid, splendid. I am so glad we are of one mind. Colonel Christie, good day."

In a room hardly less elegant but infinitely more comfortable Colonel Christie summoned his second-in-command.

"Sit down, Dawson, we have much to discuss. We are about to declare war."

"War, sir? May I ask against whom?"

"Certainly, this isn't the Ministry of Defense. France."

"France? There's no denying they're a shocking lot of—"

"Quite. I'm afraid I may have misled you somewhat. An entirely unofficial declaration is what I had in mind. The hostilities to be carried out by our Section."

"I see."

"Do you?" Colonel Christie laughed shortly. "I shouldn't tease you, but the ministerial manner is dreadfully catching. I must watch myself. Pour yourself a drink, Dawson, and let's consider this matter."

"Thank you."

"Now then, what exactly is our goal? It is to coerce the sovereign state of France into a situation in which it will be inevitably and inexorably compelled to recognize its actual status as a lesser power, to reintegrate itself within the Common Market, and in general to rejoin the comity of Western nations. Not at all an easy task. Especially as the means must absolutely preclude the open declaration of hostilities or the traditional methods thereof, which could only invite mutual destruction."

Dawson pondered, then said, "In other words, our purpose is to render ineffective their armed forces, or to smash the franc, or to destroy their morale, but without recourse to atomic warfare, naval blockade, armed invasion, massive propaganda, or other overtly hostile acts? As you say, not an easy task."

"Which makes it all the more enthralling, don't you think? A stern test of our native ingenuity. Come, let us begin by considering the beginning. France. What, Dawson, is France?"

"Well. Where does one start? A European power, roughly fifty million people, area something over two hundred thousand square

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miles, nominal allies—"

"Let's probe deeper than that. To the spirit of France, Joan of Arc, the Revolution, Napoleon, Balzac, the Marne, de Gaulle, *la mission civilisatrice française*..."

"Ah. What precisely is it that makes a Frenchman a Frenchman, rather than an Englishman? To subjugate France we first identify, then subjugate, her soul..."

"Excellent, really excellent. Well, Dawson, what *is* the soul of France? What springs instantly to mind?"

"Sex. Brigitte Bardot. The Folies Bergere. The—"

"A two-edged weapon, I'm afraid."

"Surely the deprivation of sex in England would hardly be noticed?"

"Perhaps not, but it is difficult to see how a campaign of sexual warfare could be successfully implemented. But this is quite promising, Dawson, do carry on."

"Well. The Eiffel Tower, the Arc de Triomphe, the Riviera, châteaux on the Loire, perfume, camembert cheese. French bread, rudeness, independence, *bloodymindedness.* High fashion, funny little cars, berets, mustaches, three-star restaurants, wine—"

"Wine... wine, Dawson, wine! Red wine, white wine, rosé wine, champagne, Chateau-Lafite '29, *vin du table,* Bordeaux, Burgundy, Provence, Anjou. Wine. Nothing but wine. A nation of winedrinkers, a nation of wine! Splendid, Dawson, really quite splendid."

"But—"

"Dawson. The flash is blinding, it has me quite dazzled. Kindly hand me that almanac by your side, no, the French one, *Quid?* Let me see now, wine, wine, wine..." Colonel Christie hummed as he flipped through the pages. "Ah, yes, yes indeed. Listen to this, Dawson: 1,088,000 winegrowers, 1,453,000 vineyards, more than 4,500,000 persons living directly or indirectly from the production of wine. Average annual production, sixty-three million hectoliters, what on earth is a hectoliter? Twenty-two gallons? Good heavens, that's 1,386 million gallons per year. Eight percent is exported. Consumption: about forty gallons per person per year.

"Ah, as I thought, in 1971 France imported only 124,147,000 francs' worth of Scotch whisky, while exporting to England 494,833,000 francs' worth of wine and spirits. To England alone, mind you.

"Bearing those figures in mind, Dawson, is it any wonder that the French are an extremely unstable and disputatious race, or that England suffers a catastrophic balance of payments deficit? But here we have the means to redress the situation."

"We do?"

"Certainly we do. This inestimable almanac is kind enough to list the enemies of the vine: mildew and

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oidium phylloxera. Surely you have heard that in the 1880's the vineyards of France were almost totally destroyed overnight by phylloxera. Millions of vines had to be sent from the United States and replanted. Interestingly enough, after a few years in their new soil the transplanted vines produced wine of the same quality and characteristics as the original vines. It was, Dawson, the first example of American foreign aid, an early Marshall Plan. And equally forgotten.

"But I think that if a similar catastrophe were to overtake France today you would find few Americans in the mood to succor France yet again with Liberty Ships full of grapevines. After all, California is now one of the great wine-producing regions of the world; they would have no reason to help their fiercest competitor. No, Dawson, from every angle the prospect pleases. If I were a mathematician I should be tempted to call it elegant.

"Think of it. Economic and political chaos in France. Fifty million Frenchmen drinking water, with the inevitable result that they will see the world clearly for the first time in centuries. A shocking deficit in their balance of trade, total demoralization of a civilization founded on the restaurant and bistro, the collapse of their armed forces—recruits are forced to drink a liter of *gros rouge* per day— a notable boost for British exports—I foresee Red Cross vessels loaded to the scuppers with Scotch and sound British ale—and a dramatic return to the days when Britannia ruled the waves."

"But, sir. What are *we* to drink? I must confess, a nice glass of—"

"Nonsense, Dawson. Stock your cellar if you must. Or refine your palate. Personally, I find a regimen of sherry, hock, and port entirely pleasing. None of them, you will note, from France."

"But—"

"Dawson. 'Say, for what were hopyards meant/Or why was Burton built on Trent?' "

"I beg your, Pardon?"

" 'Ale, man, ale's the thing to drink/For fellows whom it hurts to think.' "

"Really, sir," said Dawson reproachfully.

"The poet, you know. Housman."

"Ah, I see, But the means . . ."

"Oh, come. Why do we support all those beastly biological warfare establishments if not for situations such as this? I hardly think the boffins will have explored the possibility of a mutated and highly-virulent oidium phylloxera fungus, but I should think that the prospect of developing a nasty bug which poisons grapevines rather than entire populations ought to appeal to whatever small spark of common humanity they may yet retain. After that, a few aerosol bombs . . ."

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Colonel Christie's keen eye seemed to pierce the future's veil. He smiled.

"Sir. Retaliation."

"Retaliation? Don't spout nonsense, Dawson. How *can* they retaliate? Atomic attack? Naval blockade to interdict trade in wheat and iron? That's *war*. Psychological warfare, propaganda? Impossible. No one in France speaks English and no one in England understands French. Sabotage? What could they sabotage?

"Think, Dawson, of British life, its placid, straightforward, *sensible* course, devoid of fripperies or eccentricities. Its *character*. No, no. I assure you, Dawson. The British way of life is quite invulnerable."

". . . and totally ravished. I tell you, St.-Denis, it will mean mobilization and inevitable war. Already the President has designated a War Cabinet, and we are to meet later this evening. Ah, who would have thought it, that nation of shopkeepers, that race of hypocrites, that even they could sink so low? Not only an act of naked aggression but also an insult to the very honor of France herself. Ah, Perfidious Albion!"

Colonel St.-Denis nodded deferentially. "If I may suggest, however, *M. le Ministre,* it is less a question of Perfidious Albion than a question of rank Britannic amateurism. Ah, these English *milords,* with their love of the hunt, their cult of the gentleman, their espousal of the amateur, their scorn of the professional. Because of a long-forgotten battle won on the playing fields of Eton they have never learned that the rest of the world has never attended Eton, nor needed to. They have not learned that we—that I, Jean-Pierre François Marie Charles St.-Denis—that we are not gentlemen and that we do not fight like gentlemen. We fight like professionals and we fight to win."

"Bravely spoken. But are you saying—"

"Exactly, *M. le Ministre.* A plan. A riposte. Check and mate."

"But the vineyards, totally ruined, beyond reclamation. A nation on the verge of depression or revolution. Were it not necessary to mobilize the Army it would be necessary to confine it to barracks."

"Details. Of no importance. Do not the British still boast of their Battle of Britain and of Their Finest Hour? So it shall be with France: Her Finest Decade." St.-Denis waved a hand scornfully: "A few epicures, a few tosspots, they may suffer. For the rest of us there is work to do, work for the Glory of France!"

". . . like a charm, sir. Complete panic and demoralization. Already there's talk of a Sixth Republic. No, Intelligence reports no indication of a counterattack. Simply a nationwide balls-up."

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"Exactly. As I told our masters this morning. How can one expect a committee of Froggies to come to a decision without a bottle of wine to hand, eh, Dawson?"

"Up to a point, sir."

"Come, come, Dawson, not getting the wind up, are you? I tell you, you're far more likely to find your name on the next Honors' List."

. . . not bloody likely, with you to hog all the glory . . .

. . . and now, St.-Denis, if you would kindly tell us of what your plan consists?"

"Certainly, *M. le President.* You may recall your last visit to England, the sporting weekend with the Prime Minister at his country residence, Chequers?"

The President of France did not attempt to conceal his shudder.

"I thought so. I am certain then that after some ungodly meal of boiled mutton, brussels sprouts, and treacle pudding, you retired to your chamber for a restorative glass of cognac and a troubled sleep?"

"Really, St.-Denis, you surpass yourself."

"Thank you, *M. le President.* After a troubled sleep, then, you were most certainly roused at some ghastly hour of the morning by a discreet knock upon your door. Contrary to your expectations, perhaps, it was a manservant, a butler even, come to wake you for a strenuous day amidst the fogs and grouse. And what, *M. le President,* did this unwelcome intruder bear inexorably before him? The so-renowned breakfast *anglais*? Ah, no! I will tell you what this English devil placed before you for your ever-lasting torment."

The President shied back before an accusatory finger.

"He placed before you, *M. le President, a pot of tea!*"

"Tea?"

"Tea."

"Ah. Tea. Yes, I remember it well." He shuddered anew. "But surely, Colonel St.-Denis, you are not proposing that we poison the English population by forcing them to consume tea? The rest of the world, yes, it would be mass genocide. But the English, they *drink* tea, they thrive on tea, it would be, how do they say, bearing charcoals to Windsor Castle."

"Not exactly, *M. le President.* I am certain that as an intellectual exercise you are prepared to admit to the fact that Englishmen drink tea. But do you comprehend it *here*?" He clutched both hands to his heart. "Here, with your soul? Or—it is almost indelicate to speak of this—have you ever grasped the sheer *quantities* of tea consumed within the British Isles? Of course not.

"Page 906 of the invaluable *Quid?* informs us that an Englishman takes at least 2,400 cups per year—six to seven per day—compared to thirty-three per year per Frenchman . . . Good

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heavens, are you all right?"

"I felt quite giddy for a moment. What appalling statistics."

"Only the Anglo-Saxon could contemplate them without reeling."

"One hardly knows which is worse, the English consumption or the fact that *Frenchmen* appear—"

"Let your mind be at rest. French consumption is confined entirely to immigrants from our former North-African colonies, or to herbal *infusions* quite incorrectly called tea."

"Ah, thank heavens for that. But returning to—"

"Once you have grasped the *magnitude* of the consumption, you must then grasp the social *importance* of the consumption. It is the very fabric with which English society is constructed. Before-breakfast tea. 'Elevenses.' 'Put the kettle on, dearie, and let's have a nice cuppa.' Thick black tea drunk by the mugful in the Army and Navy. Entire industries coming to a halt at a wildcat-strike called because of improperly-brewed tea. Afternoon tea with its cakes and crumpets and cucumber sandwiches and who dares guess what else?"

"I feel quite ill."

"I also. Fortunately there remains only the Ceremony of the Teapot, the single article of faith which sixty million Englishmen hold in common. First the teapot must be heated, but *only* by filling it with boiling water. Then—"

"St.-Denis. I can bear no more. You have a course of action?"

"A simple virus, *M. le President.* Can the land of Pasteur and Curie fail before such a challenge?"

The room was somberly but richly furnished. A Persian rug lay

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on the floor. A fire crackled in the hearth.

The Permanent Secretary nodded approvingly. It was always satisfactory when a muddle began to regularize itself.

"Kind of you to drop by like this," said Colonel Christie. "Whisky-soda? The syphon's behind you."

"Kind of you." He limned the room with a gesture. "You do well by yourself here."

The Colonel shrugged urbanely. "You wanted to see me?"

"That is, the Minister wanted me to see you. He thought you might be interested in an informal tally sheet we have drawn up regarding the results of last year's Operation . . . er . . . Bacchus."

"Very good of him indeed."

"In so very informal a minute we thought it might be profitable to list the items under the headings *Credits* and *Debits*. The Minister was a former Chartered Accountant, you know."

"I recall," said Colonel Christie as he began to read the first sheet of notepaper.

Credits:

1. Destruction of all French vineyards, with concomitant confusion and social unrest in France, as apparently planned.

2. Twenty percent increase in the exportation of Scotch whisky, for a three-week period before the blockade.

Debits:

1. Retaliation in the form of complete destruction of the world's tea supply by means of a still-uncontrollable mutated virus.

2. Tea-rationing, followed by riots. Three general elections in the space of eight months. Martial law eventually declared.

3. Tea no longer available, nor in the foreseeable future.

4. Total decomposition of the fabric of British society.

5. This peculiarly-depraved act of war is currently being litigated at Geneva and before the World Court as a Crime Against Humanity, but we have reason to believe that our suit is not being well-received.

6. Expulsion of England from the Common Market.

7. The world's opprobrium.

8. Economic embargo and naval blockade by a task force of seventy-three countries. Only the London Airlift and the United States Navy maintain England as a viable state.

9. Dwindling supplies of French wine. Blackmarket, and concomitant problems.

10. After a few months' confusion, unexpected and absolute unification of the French people in the face of adversity.

11. As the world's now-largest importer of wine, France is directly responsible for the sudden Economic Miracles in Italy and Algeria, both of which have doubled their vineyard acreage under production.

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Algeria has joined the Common Market and is considering becoming once again an integral part of France. German, Spanish, and Greek wine production has also benefited greatly.

12. To further promote this rapidly-rising spiral of prosperity, France and the other members of the Common Market are nearing Economic Union and hope shortly to achieve Political Union. It is felt that France will dominate and direct this nation of 250 million people.

13. To counter the cost of wine importation and the subsequent balance of payments deficit, France has already donated its armed forces (and expenses) to a United European Command.

14. Millions of acres of tea-producing land and millions of people in sixty-eight countries suddenly have become available for other forms of agricultural production. With the vast market unexpectedly open in France and other countries to the importation of wine, most of this acreage has been given over to wine production.

15. Some 4.6 million Frenchmen have spread to all corners of the world to aid the undeveloped countries in their effort to produce potable wine.

16. Due to the high professionalism of the French Secret Service, it is accepted unhesitatingly throughout the world that the American CIA was responsible for the mass destruction of the tea plant. Spurred by the efforts of 4.6 million ambassadors of goodwill, French has completely replaced English as the secondary language being taught in the world's schools. It has, of course, become once again the standard language of diplomacy. It is thought that these factors will result in the emigration of at least half-a-million teachers from France, and a corresponding momentum will be given to the *mission civilisatrice française.*

17. The first wine-fair has opened in China. It was attended by Chairman Mao, who pronounced his unqualified approval of a *Nuits-St.-Georges* '66.

18. It is entirely foreseeable that with the accelerating rate of spread of French culture and influence, and as eventual leader of a United Europe, within a decade France will be the world's dominant power.

"Rather gripping, don't you think?" said the Permanent Secretary.

"Quite," replied Colonel Christie dryly.

"Interesting, the amenities of your . . . er . . . suite," said the Permanent Secretary as he strolled about the room in unabashed fascination. "One had no idea such comfort obtained in the Tower. One naturally thinks of dank dungeons and durance vile, that sort of thing, eh?"

"Quite," said Colonel Christie. "Oh, quite." ■

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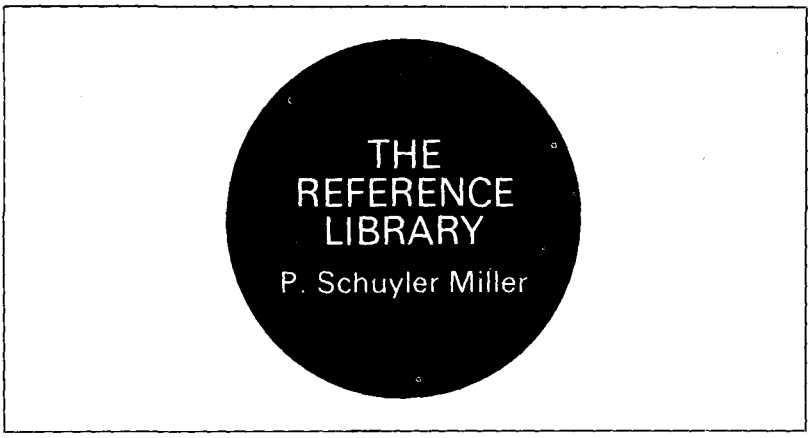

THOSE WHO DO

Bernard Shaw once said: "He who can, does; he who cannot, teaches." It may have been true in his day, and it may be true again today, but the colleges are full of good teachers who, sometimes brazenly, sometimes behind a mask, write good books. A good many of them also invite novelists, poets, essayists, *et al.* to be "writers in residence" for a time and share their ideas and sometimes their skills with students.

Robin Scott Wilson, once of Clarion State College in Pennsylvania, now an executive in the Midwest, is one of these multiple-threat people. In the science-fiction world he is probably better known for the Clarion Workshop which he set up in the summer of 1968, and which brought to a small rural town an unexcelled mix of science-fiction and fantasy writers. The spinoff has been impressive, both in new writers and in anthologies. The Workshop left Clarion after Wilson did, and has been footloose ever since. And as a tribute to those teachers who can—and do—both teach and write well, he has assembled an anthology—"Those Who Can" (Mentor Books, No. 451-MW1236; 333 + xii pp; $1.50) which combines stories and essays on writing.

Jack Williamson, the first teacher/SF writer to receive the Science Fiction Research Association's Pilgrim Award for distinguished scholarship in the SF field; James Gunn, Daniel Keyes, Joanna Russ, and Wilson himself are or were all full-time members of university English departments. The others—Harlan Ellison, Ursula Le Guin, Robert Silverberg, Samuel R. Delany, Frederik Pohl, Damon Knight, and Kate Wilhelm—have taught at Clarion and at universities in their own neighborhoods, at night, in informal courses, and whenever they saw a chance to be

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useful. Being the people they are, they learned as they taught—perhaps more than their students did, but probably not.

The pattern these writing teachers were asked to follow pairs one of their stories (it isn't clear whether the writer selected it, or the editor) with an essay on how it illustrates a phase of storytelling: plot, character, setting, theme, narrator's point-of-view, and style. The anthology has good stories in it, some very good, some not, but it is only incidentally for readers who are not interested in what makes successful writers tick (and sometimes explode).

It seems to me that the writers whose commentaries are most worth reading are the ones who ignored their instructions and wrote personal essays about the way they see writing and writers. My notes go quite out of hand with stars and underlining and marginal slashes over James Gunn's essay called simply "On Style" and published with the initial short version of his "The Listeners." He makes very clear the division between storytellers and self-appointed artists: in his view and mine, style should fit the story, not decorate the author.

I also have large smeary stars next to my notes on Samuel R. Delany's commentary—which makes the extremely important point that reading and writing are two totally different processes which call on different facets of the person's individuality. A highly visual writer himself, Delany shows how a writer harvests his conscious and unconscious . . . and if he has never planted anything there, he will not have much to harvest.

There are more stars by Harlan Ellison's dissertation on character, which he illustrates better than anyone else in the book with his "Pretty Maggie Moneyeyes," the story of the girl who haunted a slot machine. Robert Silverberg's "Sundance" is supposed to illustrate the importance of setting, but it is an even better illustration of Harlan's points about characters making a story memorable.

Although Jack Williamson has undertaken the task of making the nuts and bolts with which he constructed his story "Jamboree" evident to his readers, it isn't one of his really good stories and I really can't buy him as a nuts-and-bolts writer. He may have conscious rules for sieving his subconscious and selecting what to keep and what to put away for a while, but I simply can't see him bent over a Heathkit. Damon Knight, no mechanic either, shows in an annotated version of his "Masks" how his kind of writer does consciously enrich and embellish an already good story. Artists call the process overpainting; it can completely change what Damon calls the "spirit" of a story, and it can take the spirit out of it, but not when it is done the way Damon shows himself doing it.

I haven't said much about the story part of the anthology, and I don't intend to. Any one of the essays would be worth all the space I have here, and the book could last me the year. Daniel Keyes, exploring the warped character of his

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"Crazy Maro," makes Maro a distorting mirror reflecting the person of his narrator, Denis. Character is indeed all-important in most of Keyes' stories. Remember Charly in the novelette, "Flowers for Algernon," which became an equally fine novel, then a great TV special and film? Joanna Russ, with "The Man Who Could Not See Devils," demonstrates how the setting of a story can be the antagonist. Ursula Le Guin, talking about her clone story, "Nine Lives," throws a challenge directly at the reader: "Until you can read the lines, you can't read between the lines." (Can it be that she feels that a "story" that doesn't communicate may have nothing *to* communicate?)

Kate Wilhelm's commentary on point-of-view is trickily illustrated with her story "The Planners": a psychologist, fantasizing, is in effect a dual observer, at times seeing things as they are, at others as he wants them. Wilson's own contribution, not necessarily SF at all, uses the omniscient point-of-view to show a student becoming depersonalized, literally and figuratively--man into IBM card: and which, in our time and place, is more real?

Writers can't really talk to each other about writing, Frederik Pohl asserts in the statement that follows two short bits where style and theme are inextricably interwoven ("Grandy Devil" and "Day Million"). The parts of this book that try to teach writing skills make the least sense. The parts that show would-be writers how other good writers think and feel about the world and the way they see it--those are the reasons for reading "Those Who Can." Yet Gunn, Delany, and Pohl himself do both. This is a book of pigeonholes . . . but the pigeonholes all open into one another.

THE MANY WORLDS OF POUL ANDERSON

edited by Roger Elwood • Chilton Book Co., Radnor, PA • 1974 • 324 pp. • $6.95

This collection does not include Poul Anderson's best short fiction, or even a representative selection of it. It's too short and he is too varied a writer. It does have the two-award winner, "The Queen of Air and Darkness" (better at every reading) and his 1961 Hugo winner, "The Longest Voyage." Four of the stories were first published here.

The bonus factors in the book, though, are three essays--two by students of Anderson's work, and his own prospectus for a strange new planet, "A World Named Cleopatra." The latter essay shows how (as Hal Clement has done elsewhere) he arranges the parameters of a world and its people for his stories of the slow advance and retreat of mankind among the star-worlds.

"Her Strong Enchantments Failing" by Patrick L. McGuire probes "Queen of Air and Darkness" and its themes, traces the latter through some of Anderson's other books and stories, and gives them the critical analysis of modern academic scholarship. From where I sit, happily reading the story again, I think

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some of the very things McGuire sees as flaws from an "objective" point of view are subjective strengths that Poul used for very good reasons. "Challenge and Response" by Sandra Miesel, revised from a version in the excellent 'zine *Riverside Review* (recently moved to Florida from Saskatchewan), explores Anderson's science fiction and fantasy more comprehensively.

The book opens with "Tomorrow's Children" (Astounding, 1947). This is one of a number of post-holocaust stories, with the familiar pattern of mankind trying to struggle back to some kind of normality in a world full of danger spots and strange mutations. It is exceptional in quietly pointing out that neither science nor magic can make such a world go away—mankind can and must live in it, amidst his own genetic shatterbelt. "Epilogue" (Analog, 1962) is a kind of final chapter in this development, as men come back from the stars to an Earth they have abandoned, to find that the machines they left behind have evolved and are now "men."

The award-winning "Longest Voyage" deals with other men on another world in a deliberate reenactment of Columbus' voyage of discovery (which meant "exploration" then and for a few centuries more). It is also a kind of counterpart to Anderson's novel, "The High Crusade," but with a very important difference. In that yarn a medieval knight captured a spaceship and went out to discover the stars, in both old and present senses. But Captain Rovic of "The Longest Voyage," when he finds a spaceship among the Stone Age savages of his "America," reacts very differently. He is a Poul Anderson man; he understands the forces that build and destroy human societies, and he acts accordingly.

There are three more. "Journey's End" might be called a "Silverberg" story, though others have used the basic theme. A telepath searches for the fellow telepath, as powerful as himself, whom he once "glimpsed" mentally as their trains passed. He finds her—and the inevitable happens. "The Sheriff of Canyon Gulch," written with Gordon Dickson, is the first of the Hoka stories. The intelligent but flighty little teddy bears have been powerfully impressed by yarns and films of the Golden West and are reliving its life to the hilt, with their racial enemies, the reptilian Slissii, as "Indians." A marooned spaceman has to go along with the game. Gentle fun, like all in the series.

I had forgotten "Day of Burning," here in 1967. It is a key story in the author's complexly interwoven novels and short stories in which mankind discovers the planets and races of the Galaxy (in the Columbus/Rovic sense), builds up a trade network among scattered colonies and nonhuman races, generates a human empire that gradually decays (the Flandry stage), and goes on to things we don't yet know as rival and partner of other sapients. It is a Falkayn story, which explains how the Polesotech-

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nic trading league transformed the planetbound reptilian Merseians into a powerful enemy and empire, that in later stories fights the Terran Empire tooth and nail for preeminence in the Galaxy. It also has something to say about supranationalistic agencies and institutions, for Falkayn finds an unlikely group to speak for the Merseian race in all its splintered fragments. Chee Lan and Adzel the centaur, his partners in trade and intrigue, are nice to have around again, but really have only walk-on parts.

STAR RIDER

by Doris Piserchia • Bantam Books, New York • No. Q8408 • 219 pp. • $1.25

Cordwainer Smith would have enjoyed this book. Its mood owes something to his, and it could take place in a later universe than he describes. Lone (alias Jade) is not C'Mell, or the lady of Clown Town, or that other who sailed the Soul, but they would understand each other. Mounts and varks could both have evolved from the manipulated beast-folk of his underworld.

In the future of the star riders, mankind has fissioned. One strain has become the jaks, telepathic rovers among the stars, linked to their almost symbiotic mounts by the power of "jink" that shows them things eyes cannot see, links them with places and beings strewn across the Galaxy, and takes them together outside both space and time wherever they want to go—except to other galaxies.

Earth has been abandoned, a disgusting sewer with a hidden treasure and a legend that is Galaxy-wide—the rumor of Doubleluck, the world all men seek. Among the would-be seekers are the other two strains, the retarded gibs of Gibraltar and their rulers and keepers, the space-riding Dreens. Their histories, their goals, and their biologies are inextricably interwoven and knotted to the teenage jak who calls herself Lone until she is renamed Jade by the omnipresent Big Jak, who is sometimes Valdar the utterly inhuman vark, and for a time crippled by the experiments of the crosseyed jinkless Jak, Shaper.

The first part of the book, in which we come to know that prickly character Lone and her mount Hinx, is the best. It lets down a bit in the middle sections, in which she is a prisoner on Gibraltar, takes out her frustration on the gibs, and learns something about the dangerous nastiness of the Dreens and the not-as-advertised nature of varks. But all this has its purpose, which does not become plain until the very end.

This should be a contender for an award. I'd say the author is assigned reading, and I'm sorry I have neglected her. The book is tagged "A Frederik Pohl Selection," and perhaps it and others will take the empty place left by the Ace Specials of fond memory. I wish someone at Bantam had read the book before the cover was designed, though. It's an eyecatcher, and it does get the mood of star riding—but Hinx, Lone's mount, is a dog, not a horse, and she is a blonde, not a brunette. Nit-picker!

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A Calendar of Upcoming Events

log

October 26; 1974:
The Cunard Line's science fiction cruise leaves San Juan for a week in the Caribbean. SF writers and artists Ben Bova, Gordon Dickson, Sonya Dorman, Kelly Freas and Frederik Pohl will lead discussions and workshops. Rates begin at $447 per person. Reservations and information can be obtained from local travel agents.

November 1, 1974:
Deadline for the National Fantasy Fan Federation story contest. Info: Howard De Vore, 4705 Weddel Street, Dearborn Heights, Michigan 48125.

November 1-November 3, 1974:
KWEST-CON 74 (Star Trek Oriented Convention), Kalamazoo, Michigan. Info: KWEST-CON 74, 1309½ South Westnege Avenue, Kalamazoo, Michigan 49008.

November 10-November 12, 1974:
ACM 5th US Computer Chess Championship (Association for Computing Machinery Annual Conference), San Diego, California. Info for ACM Conference: ACM 74, Attention Lyn Swan, Box 9366, San Diego, California 92109. Info for Chess Tourney: Monty Newborn, Department of Electrical Engineering and Computer Science, Columbia University, New York City 10027.

November 18-November 21, 1974:
Fourth Conference on Weather Modification (American Meteorological Society), Ft. Lauderdale, Florida. Info: R. Sax, Experimental Meteorology Lab, NOAA, Box 8044, University of Miami Branch, Coral Gables, Florida 33124.

November 23-November 25, 1974:
FILM-CON 3 (International Fantasy Film Convention). Registration fee: $10. Info: Film Con, Box 74866, Los Angeles, California 90004.

November 29-December 1, 1974:
INFINITY 74, Commodore Hotel, New York City. Theme: Extraterrestrials. Registration: $4 until November 1; $5 after. Info: Joe Rizzo, 21-68 41st Street, Astoria, New York 11105.

December 13-December 15, 1974:
PHILCON (Philadelphia Science Fiction Convention), Benjamin Franklin Hotel, Philadelphia, Pennsylvania. Registration: $4 in advance; $5 at door. Info: Gale Burnick, 4300 Spruce Street (Basement), Philadelphia, Pennsylvania 19104.

—Anthony R. Lewis

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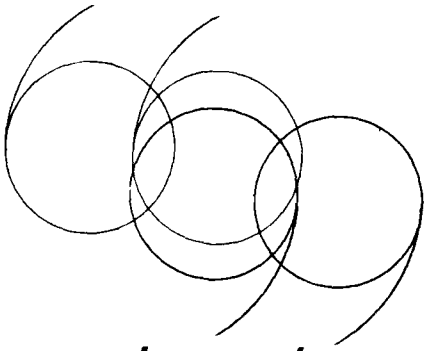

brass tacks

Dear Ben:

I agree wholeheartedly with your June Editorial, "Teaching Science Fiction," although I wish the discussion of that abomination *The Starlost* had been excluded. Despite your personal experience, I believe that film and TV raise separate problems.

You are correct. The most obvious and immediate problem is that at both the high school and college levels, teachers who have little or no acquaintance with science fiction will be asked/required to teach the new courses. For the past few years I have averaged five to ten inquiries a week—I imagine you have had more—asking for help in planning new courses. I am not sure how many "how to" manuals aimed at the new teachers are now in preparation.

Much of the interest is not in science fiction *per se*, but in futurology. One woman from Wisconsin asked me to forward to her all materials useful in her new futuristics course at the kindergarten level. Another asked how she could become "an instant expert" in the future . . .

Your Editorial stresses the most obvious problem: the teaching of the new courses. There are others. First, the flood of new "texts" which are now being published. The more the merrier—so long as they are well-prepared and the stories carefully chosen. But stories (old or new) thrown together on some pretext, in order to grab a share of the mushrooming market, can be of little worth if the teacher does not have the perspective from which to handle them.

Secondly—for whatever reasons—the field of literary scholarship has to a large extent alienated much of its audience from the rich and varied tradition of Western literature. It has done so by an intellectual snobbery which chose to ignore all forms of popular literature and to rely upon a high-sounding, often empty rhetoric. Too often in the search for a methodology which would make the study of literature at least sound like the study of science or social science, literary scholarship has produced no more than a new jargon. I hope this does not happen to the study of SF . . .

Lastly, despite my agreement with all that you said, I somewhat regret the appearance of your Editorial. I hope that I am wrong, but I imagine that you will be deluged with letters insisting the "nasty academics" keep their paws off science fiction.

That is impossible. As soon as a story is written and published, it becomes part of the literary tradition of its culture. So it is with

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science fiction—now, as it was when Wells, Haggard, Stockton and London wrote. I hope that all of us who have an interest in science fiction can cooperate in the assessment of the important place that it has in the body of Western literature.

THOMAS D. CLARESON
Chairman, SFRA
Box 3186
The College of Wooster
Wooster, Ohio 44691

We should all welcome academia's interest in science fiction, PROVIDED that the standards of scholarship equal (at least) the standards of the material being studied.

The following pair of letters arrived at the Editor's desk on the same day. They are typical of the constant "gored ox" reaction that is elicited by many of our stories. As long as we keep getting letters like these, we'll know we're keeping you readers stimulated!

Dear Mr. Bova:

I had decided not to renew my subscription to Analog, as it has deteriorated so much since John Campbell's death, but at the last minute I yielded. It is not easy to give up an old friend of so many years, even when you feel that he has changed so much that you have little left in common.

In the probably futile hope that the old Analog spirit and quality will ultimately reappear, I am giving it another chance and I am renewing my subscription for a trial period of one year, instead of the usual three years.

I am not one of those who feel shocked by the appearance of a little bit of sex in your stories. Science-fiction heroes can be male and female with all their normal instincts, and I have nothing against that.

But the crypto-leftist tendencies of the new Analog are a betrayal of the Campbell tradition. The choice of authors seems to reflect a deliberate policy of eliminating the old team of writers, and unfortunately the quality of most of the stories selected is so poor that Analog—which used to be by far the best of all science-fiction magazines—is now close to the bottom of the list.

Maybe you are attracting a new breed of readers, but I would be surprised if a survey of your subscription renewals did not show that you are rapidly alienating the traditional ones.

ANDRE J. DITTE
535 East 86th Street
New York City 10028

There is no policy of exclusion at Analog toward any ideas or authors—only toward poorly-written stories and hoary concepts. And our subscription renewals are doing very nicely indeed.

Dear Mr. Bova:

Lately I've been going through my collection of Astounding/Analog, some twenty years' worth, and in the later ones I've noticed some odd contrasts. On the one hand, I have read criticism of New Wave science fiction—by both your readers and your reviewer—stating that it wallows in negativ-

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ism, institutionalizing the antihero and emphasizing the seamy and pessimistic view of life. On the other hand, it is in the pages of Analog itself that I have seen stories that are little more than expressions of hatred, fear, bigotry and contempt directed against certain members of our society—the poor, the nonwhite, the hippy, youth in general, those concerned with ecology and civil liberties, and in general anyone whose philosophy and lifestyle do not conform to the capitalistic, militaristic, technology-at-any-cost Social Darwinism that John W. Campbell made into an Analog tradition during his tenure. I don't have the complete collection at my disposal right now, but a partial list would include "Forty Days and Nights," "The Jungle," "The Martyr," "Generation Gaps," and elements of "Cloak of Anarchy" and "Notebooks of Lazarus Long"—these taken from seven out of the past twenty-seven issues—not to mention ideological blockbusters such as "The Moon Is a Harsh Mistress" and a number of your more regressive Editorials. If it isn't negativism to play on the prejudices of your readers and divide the human race into deserving straights, irresponsible children and genetically-programmed failures, then I'm Mary Poppins.

Of course, in most charges of misuse of media, the truth is a perfect defense, and whatever else your stable of obscure propagandists are, they are undoubtedly True Believers. But truth is a remarkably slippery thing when you try to express it through fiction. Do you believe that the hippy culture bears the seeds of destruction? Just write a story about a future in which hippies take over and life becomes unbearable—proof. Do you believe that poverty stems from genetic inferiority, and that even the best of social programs are doomed to failure? Just write a story in which these best of social programs do fail miserably—proof. Ah, if only human nature were as malleable as people's perceptions of it! But for every genius who has written the truth about human nature into his fiction, there are a thousand hacks who distort it to fit their prejudices, or those of their editors . . .

A year ago, I would have implored you to change your editorial policies, to sweep the poison pen from your pages—in fact, I think I did. But I wouldn't now, not after rereading twenty years of Brass Tacks. If there are that many people who are willing to pay premium prices to keep hatred and prejudice in their science fiction, so be it. I do think, though, that your magazine and its readers could afford to be a little less hypocritical about the alleged negativism of the New Wave.

MARTIN SCHLESINGER
570 7th Street, 1C
Brooklyn, New York 11215

Analog is an open forum for ideas from all parts of the political and social spectrum. In the past year or so we have published "A Bonus for Dr. Hardwick," "The Time-Traveler," "Who Steals My Purse," "Pigeon City," and many others that are a bit to the left of center.

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Dear Mr. Bova:

In your Editorial, "The Idea Factory" (July), you exalt the one feature of science fiction that has consistently been its major weakness: the idea or story-premise.

When you speak of a "literature of ideas," it is subsequently clear that you are considering ideas only in the sense of *postulations*—premising some technological or sociological feature in society and tracing its ramifications. This kind of story seems to be the meat-and-potatoes of Analog. But at heart, this Campbellian romance with ideas is no more than the Gernsback formula with a facelift. Where once a Gernsback hero would rely on *super*science, the Campbell hero today relies on *pseudo*science (*e.g.*, psychology, economics, military-political strategy). In the end, the story becomes the background for the idea, when it should be *the other way around.* ("Earth, Air, Fire and Water" is a good case in point.)

It is a shame that science fiction has been advertised by its fans as being "extrapolative" fiction. This causes the critical standard to focus on ephemeral scientific fads (*e.g.*, polywater or tachyons) or on equally transient themes of social "relevance" (*e.g.*, ecology, bureaucracy, or hippies). Such stories are dated even as they hit the stands. The consequence has been a great neglect of ideas in a *philosophical* sense—where some departure from conventional thought motivates the theme and action of a story. (Practitioners of this school are Ursula LeGuin and Philip K. Dick.)

Even within the context of ideas *qua* postulations, you manage to criticize only minor shibboleths of the genre. Large myths need reexamination. For instance, science fiction seems to universally accept the ubiquity of the State—dwelling on government corruption, espionage, warfare, and power politics. Virtually all space exploration seems to be conducted by the military. Warfare, in defiance of the most rudimentary considerations of economics and technology, is deemed feasible and rational(!) across interstellar distances.

Science fiction's statist proclivity is bad enough—without it also reinforcing the tendency to view all issues in terms of good versus evil. This perspective constitutes melodrama, another unwholesome heirloom of the genre. Melodrama is a poor vehicle for emotional experience, because no healthy person relates to the world in a good versus evil context. The experience of life is that of self-discovery and personal fulfillment—and these elements, when fictionalized, constitute *drama.* (Try Silverberg's "Book of Skulls," and see.)

It is this issue of drama that really underscores the inadequacy of the idea-as-premise in science fiction. If literature is to be successful art, it must communicate an emotional *experience* to the reader—not an emotion-laden *issue.* This can only be done if drama, characterization, and plot have primacy in the creation of a story. The story-premise must be held completely secondary, open to radical change in order to accom-

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modate the evolution of the theme and action. It is the primacy of idea that has restrained science fiction from the growth it deserves, chaining it within the confines of ideology and linear extrapolation.

Despite your last-minute invocation of the importance of people in science fiction, your Editorial and your magazine evince a strong commitment to the primacy of *idea* over any other thing in judging the worth of a story. Because of this, your criticisms have a distinctly hollow sound—the sound of a pot calling the kettle black.

MIKE DUNN
Aerospace Research Laboratory
University of Washington
Seattle, Washington 98195

Much of science fiction has dealt with the relationship of the individual to his (or her) environment. Very often this environment has been a social milieu that is an exaggerated view of some present-day problem area: hence a bevy of "statism" stories—and stories where the individual character is barely sketched into the foreground of an action-adventure.

Dear Mr. Bova:

I have just finished reading the August issue. Cynthia Bunn's "And Keep Us From Our Castles" is the best story you have published in some time. As a vision of present evil projected into the future, it is worthy of comparison with "1984." The story would have been disturbing indeed, if it had been published a few years ago. The government representative in the episode on pp. 97-98 reminded me of H. R. Haldeman; if the latter were still in power, I know I'd be shivering.

You will get some flak, and some canceled subscriptions, from readers who can't take anything this real. Probably they will tell you the story is too sexy. Bosh. What really gets them in a stew is any attitude toward authority figures that is less than totally submissive. Remember the ruckus about "Foundlings Father" and Joe Haldeman's moving story "Hero." The objections to the illustration to "Foundlings Father" were not really directed at the nude figures. Simple nudity is not regarded as obscene in this country today—if it were, most art galleries would be rated "X." The real cause of the objections, I think, was the fact that the "Adam and Eve" characters were jauntily defying a self-appointed authority figure. As for "Hero," the same type of reader was upset by the author's belief that war is often a squalid and useless thing.

I am of the opinion that we Twentieth-Century Americans have a worse time with the problems of authority, obedience, rebellion and so on, than the Victorians ever had with sex. Movies like "Dirty Harry" do for us what pornography did for people a hundred years ago. Artistically honest stories, on the other hand, are among the best means that we have to deal with our hangups. So keep on as you have been doing, and let the prudes go where they may!

CHRISTOPHER J. HENRICH
2387 Morris Avenue, D4
Bronx, New York 10468

Two hundred years ago, Americans

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were beginning a socio-political experiment; each generation of Americans provides a new data point. The experiment is still underway.

Dear Mr. Bova:

My vote for the three monkeys (Hear no evil . . .) award goes to Mr. Heckart, who headed up your August letter column. Now that his subscription is running out, he will have to shun dirty operas like *Rigoletto*, dirty pictures like Botticelli's "Birth of Venus," and even dirty radio commercials that say "Fly me." The list will be endless.

Seriously though, the question has been raised that you are printing pornography. The best definition of pornography I have read is that literature "which is provocative to the sexually average man." I find Analog stimulating, but only intellectually. I find that Analog affirms human values while exploring human relationships, among which is love. Pornography is a mockery of love. Sorry, Mr. Bova, as a purveyor of porn you don't qualify. Better stick to publishing good science fiction.

JIM GOLDFRANK
10516 Edgemont Drive
Adelphi, Maryland 20783
We try, friend. We try.

Dear Mr. Bova:

I have a few comments regarding your August issue in general and the Heckart letter in particular.

Mr. Heckart states: "If the argument is advanced that sex is an integral part of the story, *then since there is nothing else in the story*, it follows that it is pornography pure and simple." (The emphasis is mine.)

Hm-m-m. Something definitely odd about that middle term—let's check it out with new input: If the argument is advanced that the President is an integral part of the Government, then since there is no one else in the Government, it follows that . . . hm-m-m, no . . . the President is the Government.

The Nixon-Heckart Theorem? Well, let's put it another way: If the argument is advanced that sex is an integral part of my life, then since there is nothing else in my life, it follows that I am a sex maniac.

Mr. Heckart's *statement* is semantic sheep dung. QED, if I were a sex maniac, I would not be reading Analog to get my kicks—I'd be out in the woods accosting prepubescent Campfire Girls and generally making life hard for stray livestock. His *opinion* I will not comment on—opinions are like noses—everyone has one, everyone has a right (whatever a "right" is) to one, and no two are alike. My quarrel with Mr. Heckart is not over his opinion; it is over his failure to use the English language with proper respect—an unforgivable failure in one who is, I assume, a teacher . . .

'Nuff said.

High praise for both Gordon Dickson and John Schoenherr—Dickson for "Enter a Pilgrim," surely one of the best short stories you've published this year, and Schoenherr for his cover. I'm hoping you'll offer it for reprint.

Keep up the fine work. Analog

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always has been, and still is, the only decent (in every sense of the word) science-fiction magazine going.

WILL PARKER
214 East Jones Street
Rear Apartment #2
Savannah, Georgia 31401
As Pogo's friend Albert once said, "I may not agree with what you said, but I'll fight to your death for my right to contradict you!"

Dear Mr. Bova:

I have only one fault to find with Gordon R. Dickson's August story "Enter a Pilgrim." It has all the attributes of a fine novel or series of short stories, but just as it was getting rolling, it ended!

Perhaps we may hear more of "The Pilgrim" in the future?

ARTHUR R. GOODBREAD
23 Chicasaw Drive
Oakland, New Jersey 07436
There will indeed be more "Pilgrim" stories.

Dear Ben:

I just had the pleasure of reading Tak Hallus' "Stargate" while vacationing on Cape Cod. What a great way to get the annual tan!

Although Smith is a rather questionable fellow (seventy-five years old and still going *that* strong?) the story still makes excellent reading, and what is more important, is quite thought-provoking. Could it have happened in the past that Thlurg and his pals on Deneb V were trying out their new bulk-matter transmitter one day, and just happened to carve out the Gulf of Mexico, or perhaps Great Slave Lake? Or could that be what happened to the mythical continents of Mu, or Atlantis?

Look at it another way. We're told that at some distant point in the past the seas were much higher. Two-thirds of our globe is water-covered. What if Thlurg got something like 15 km^3 of Pacific Ocean for his troubles? It would cause some rather instant and interesting changes here on Terra by making a bit more Firma, but what is more thought-provoking—such a thing would leave no trace or hint of what happened! Millions of years later our scientists could only note that the sea level dropped rather suddenly . . . or could they? Poor Thlurg would have gotten either a huge, instant ice cube (assuming his target area was out in space), or one hell of a bathtub-full!

I'd like to see one of your science writers play around with this for a bit, to see if the theory could explain some unknowns about Earth.

IRA STOLLER
3028 Nostrand Avenue
Brooklyn, New York 11229
Hm-m-m, Thlurg sounds suspiciously similar to that long-time accomplice of mediocre writers, deus ex machina.

Dear Mr. Bova:

Here's something Analog readers might be interested in: a two-hundred-dollar prize is being offered for the best short story presenting a solution to the problem of overpopulation. *Final* judging will be done by none other than Ben Bova and Isaac Asimov.

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Stories should be typed, one thousand words or less. The deadline is February 1, 1975. The address is: Zero Population Growth, 50 West 40th Street, New York City 10018. Entries will be returned only if accompanied by a stamped, self-addressed envelope.

ELLEN JAMIESON
417 West 120th Street, #1Z
New York City 10027
Here's your chance to put your ideas to work. Be certain to send your stories to ZPG, not Analog.

Dear Mr. Bova:

I enjoyed Dr. Holmes' article on the split brain (August), and thought your readers might be interested in related research being carried out at the Primal Research Foundation in collaboration with some of the staff at the UCLA School of Medicine. Early studies at the Primal Institute (see, for example, "The Anatomy of Mental Illness" by Dr. Arthur Janov) indicated that the vital signs such as pulse, blood pressure, brain-wave frequency and amplitude, and body temperature were lowered in patients who had undergone primal therapy, which was in accordance with the patients' subjective reports of decreased tension and the disappearance of various physical symptoms. The expanded research program now in progress (as reported in the *Journal of Primal Therapy*, Summer 1973) indicates that there may also be, in addition to other changes, a shift in patients towards the minor hemisphere—that is, "dominance" may be lessened. Neurotics may in fact be functionally "split-brained" to a certain extent: the major hemisphere, for example, may be suppressing painful memories stored in the minor hemisphere so that there is not proper access between the two sides of the brain. Primal therapy may also facilitate access between higher and lower brain centers. This is detailed in two articles about levels of consciousness by Dr. E. Michael Holden, a neurologist, and Dr. Janov in the Fall 1973 issue of the *Journal*. Since it is not readily available on newsstands, interested readers may obtain copies of the *Journal of Primal Therapy* through the Primal Institute at 620 North Almont Drive, Los Angeles, California 90069.

GLEN ALLPORT
5832 A Ayala Avenue
Oakland, California 94609
See also "The Primal Scream," by Dr. Janov.

Dear Ben:

Here's a hunk of truth that's both very funny and very sad, and which might be of special interest to Analog readers:

On May 6, 1974 I sent the *New York Times* full payment for a "Public Notice" ad in the May 12 Sunday *Times*. The copy was: "Interested in contact with ANY Extraterrestrials. Objective: communication/possible emigration. Please write *Times* Box . . ."

On Monday, May 13, having been unable to locate my ad in the paper, I called the *Times* only to be told that my ad had been refused the previous week (without notice), and would not be acceptable until

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it was accompanied by "references from a Martian."

My first reaction was that were I able to obtain said references, I sure as hell wouldn't need to place the ad. Now, however, I am left with the nagging question, "Does the *New York Times* know something that we don't?"

ELLIOTT ZUCKER

9 Cooper Road
Fishkill, New York 12524

Freedom of the press gives the publisher the power to decide what, out of "all the news," is "fit to print."

Dear Ben:

Your Editorial ("Citizens of the World," August 1974) nearly set off a dissertation on the late prehistory of Ontario and the Northeast. The process you describe happened in the Iroquois area in the five hundred years or so before contact with white men (say 900-1600 AD). You had fusion . . . fission . . . fusion . . . fission, over and over. And through it all, "nations" kept their identities, their languages, their customs.

As Poul Anderson, Ursula Le Guin, Gordy Dickson, and many another Analog regular has demonstrated again and again, this is process, and probably universal process. It is probably the first axiom of Hari Seldon's mathematics. What isn't predictable is rate. That depends on things like the Polesotechnic League, or the Hopewell obsidian - marine - shell - copper - flint trade network. Or oil, plastics, and plutonium.

P. SCHUYLER MILLER

Yes, but is the process going on at a rate that will avert collapse or devastation?

Dear Mr. Bova:

Your August Editorial was thought-provoking:

A race capable of building pyramids, landing on the moon and harnessing nuclear energy, should be capable of advancing as a society to a point where its insignificant differences are ironed out for all time.

The Egyptians built the pyramids under religious zeal.

The atomic bomb was built under pressure of war.

The space program spurted nearly instantaneously due to competition among nation-states, and has slowed down somewhat as this competition has faded (although progress is being made . . .)

What drove the barons of Europe into nation-states, or feudal territories into modern states?—the human drive under pressure or direct threat. (Note the cliché of the well-known SF plot where scientists stage a phony invasion from space so that humanity, terrified, will unite.) Unless the pressure exists (something more than an oil crisis, which may increase international frictions, rather than mend them), the human drive remains small, or nonexistent. When there is no reason, there is no will.

Who can say for certain what pressure may impel men to form a functioning global government?

JON INOUYE

12319 Aneta Street
Culver City, California 90230

Could it be the profit motive?

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GUEST EDITORIAL

continued from page 10

it killed poetry and the mainstream novel, they say. I think we can dispose of this bugbear easily. If science fiction has any vitality, criticism won't kill it. For one thing, few people read academic criticism—certainly not the readers of science fiction—and so long as writers do not accept the critics as final arbiters, they might even learn something about why they do what they do and why it works.

Science fiction traditionally has been concerned with the what, seldom the why. We have known, as readers and writers, that science fiction was different, but our explanations of the reactions have been unsatisfying. Periodically critics have sprung up among us and done us good by providing unifying theories, but their work has been limited and sporadic and seldom linked to the complete body of literature, of criticism, and of psychological experience. For a long time science fiction writers have needed literary feedback, criticism from sophisticated critics; now we well may get it. Not that we'll like it, not that much of it will not be dull and some of it unintelligent or even unintelligible, but we should not reject it outright—there are wise and intelligent literary judges outside our ranks and we can profit from their judgments. But we should not take it, nor ourselves, too seriously.

Finally, the feeling among SF people that the boom comes just before the bust: we have seen it happen before and our apprehensions overwhelm us when we see a boom approaching. There must be something wrong with it, and there must be something wrong with all those classes in science fiction being taught in colleges and universities, in high schools and junior high schools, and even in primary schools. The kids will be turned off.

Let us grant that good teaching, enthusiastic teaching, will turn on more students to science fiction than bad teaching, incompetent teaching, dull teaching. But this is true of any subject, and the level of teaching is never as high as it ought to be. A good teacher can make learning the times table exciting, and a bad teacher can turn science fiction into pedantry.

But is this true? Most of what is read in high schools is cherished for its historic importance; much of it is valuable, much of it is difficult, and much of it is dull. A good teacher can make it meaningful, can demonstrate its relevance, can even make it exciting, but he must be *good.*

In this desert of irrelevance, a science fiction story cannot help but stand out like a refreshing oasis of story and significance; a bad teacher must work hard to make it dull. Generally the teachers of SF courses are not the bad teachers.

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The ones who volunteer to teach such courses may not be as knowledgeable as we would like them but they are, I suspect, enthusiastic, open, and experimental. A bad teacher would rather teach what he has always taught.

One more encouraging aspect—science fiction usually is an elective, fulfilling no requirements. Science fiction courses have achieved their popularity in high schools as part of senior (now junior or even sophomore) English electives: students ask for such courses. They are not being required to read Asimov and Bradbury in the way they are required to read Shakespeare and Dickens. Some students choose science fiction as the least of evils, perhaps, but it may be assumed of them that they never would have come to science fiction at all if it were not offered at their school; some of them, inevitably, will get turned on.

Let us look at the numbers involved. Science fiction, Phil Klass has said, is the mass literature of the very few. Traditionally science fiction has attracted several hundred thousand regular readers and perhaps an equal number of casual readers; these figures have not changed much since Hugo Gernsback founded *Amazing Stories* in 1926, I suspect. At least the circulations of the leading SF magazines have remained relatively constant: *Amazing* printed about 150,000 copies in its early years, Analog now, about 180,000. Most of the booms we have come to dread have been in publishing, not in readership. Until now.

The number of paperback titles published and bought—though in smaller print runs than in the Fifties—is evidence of a substantial increase in the casual readership of SF, primarily among young people; and if we do not include in our understanding of "regular" the reading of magazines, perhaps of regular readers as well. They are a paperback generation; they do not, I am sorry to say, read magazines. Out of 150 students surveyed in my class a couple of years ago, only 12 bought as many as one magazine a month, compared with 74 who bought at least one paperback each month.

The reasons for this are speculative and need not concern us here. Perhaps all readers should come to science fiction as we came to it—as a glad and personal discovery. But let me point out that in my class of 150 students, only 39 had what they defined as considerable experience with science fiction compared with 51 who had some, 52 who had slight, and 6 who had none.

Across the nation 500 college and university courses may deal with science fiction in one way or another; if the classes average 30 students each, some 15,000 students are being exposed to science fiction. Of these, probably 10,000 were not regular readers of science

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fiction before entering their classes.

In high schools, readership experience with science fiction must be even less. If there are 500 college courses, there must be 3,000 high school courses averaging 30 students each (both figures are conservative); and that means 90,000 students exposed to science fiction every year, of whom perhaps 70,000 are coming to science fiction for the first time. A minimum of 80,000 new readers are being recruited. At this rate the readership of science fiction stands to grow rapidly in the years ahead.

If—I can hear the skeptics say—the students are not turned off. Aside from my conviction that students exposed to science fiction in the classroom will find it so attractive, so fascinating, that they will be turned on rather than off, I can offer two experiences in support of the notion that they are not being turned off. I did a follow-up study on my class two years ago—the returns were smaller; it was optional and the end of the semester—because I too was curious about the effect of the class on readership. Two students reported that their interest in science fiction had been decreased, 25 that it had been increased, and 11 that it had not affected their interest (perhaps because it already was as high as it could go). Twenty said they expected to read more science fiction, 2, less, and 19, about the same.

The second experience was more recent. In a trip to Auburn University, I was asked to visit a class in which science fiction was being used by an assistant instructor (a graduate student) to teach fresh-

in times to come

■ December's issue is something of an experiment.

The cover is a photograph of a work party on the surface of Mars. That's right. A photograph. Of pressure-suited humans working on the red sandy soil of Mars.

It's the result of the talents and enthusiasm of Mike Gilbert, a robust young illustrator who has devoted considerable energy to making and photographing miniature models and figurines. He has painstakingly "created" the surface of Mars, and peopled it with a work team and its equipment. We have prevailed upon Gilbert to tell us how he did it, and what some of the problems were, in a special feature titled "On Mars with Mike Gilbert."

Most of the stories, and the science fact article, will also be set on Mars. William Walling leads off with "Nix Olympica," a jolly tale of what it's like to climb the tallest volcano in the Solar System—with a sandstorm at your back and death for the whole Martian colony before you if you don't repair the water line that snakes up the mountain crest.

Bob Buckley brings us a new kind of "monster" in his story "Encounter Below Tharsis." Alex and Phyllis Eisenstein weigh in with "The Weather on Mars," and Richard C. Hoagland has a chilling science fact article, "Why We *Won't* Find Life on Mars."

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man composition. Aha! I thought. Here is the classic test. If science fiction could survive this, it could survive anything.

I asked the students what they thought of the readings. One of them, an attractive freshman named Leah, said, "I didn't understand some of it." (It turned out that what she mostly didn't understand was an excerpt from Loren Eiseley's "The Unexpected Universe" and perhaps J.G. Ballard's "Terminal Beach.")

I asked what she thought about the course, and she said she didn't like to write a term paper about something she didn't understand.

"Ah," I said, "then will you be reading any more science fiction?"

"Oh, yes," she said. "I really enjoyed it."

It is the Leahs of the world, who never would have come to science fiction on their own, who have been exposed to it in high school or college, who find it enjoyable, who restore our faith in science fiction to overcome the handicaps of garish covers, miserable movies, terrible television, and even the teaching of science fiction.

The story's the thing. Sure, let us work to improve the teaching of science fiction. But only the stories can turn people on, and only the stories can turn them off. If the standards of science fiction remain high, if they continue to be raised even higher, if the writers, at least in part, broaden the appeal of their work so that it can be read and enjoyed by Leah and her friends, then we need not worry about the growing future audience for science fiction. ■

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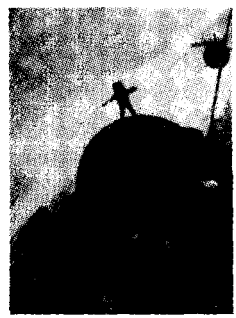

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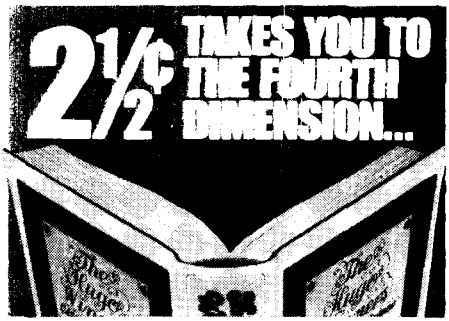

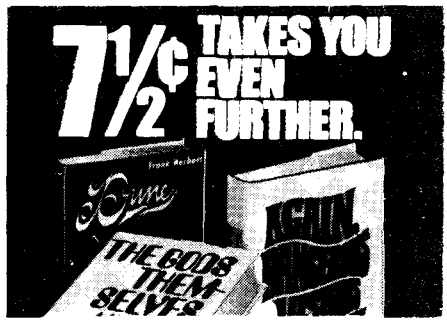

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